POPULAR PHOTOGRAPHY

HOW TO MAKE GREAT PICTURES

HOW TO PHOTOGRAPH THE OLYMPICS AND ANY SPORT YOU SHOOT P.60

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PIXEL POWER

NIKON D3200

P.73

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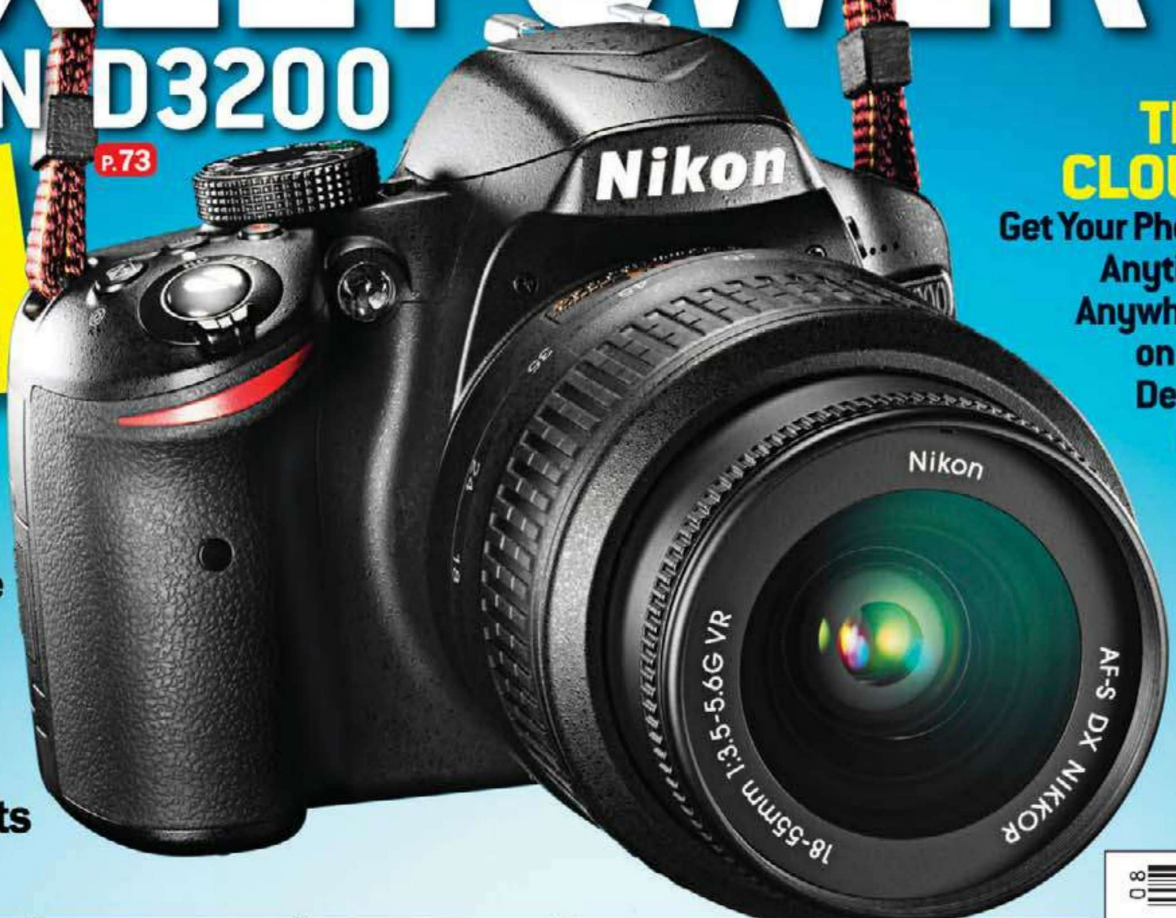

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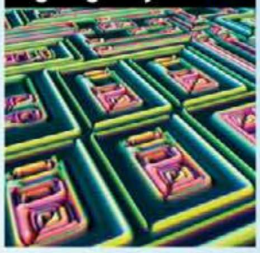

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I especially love the BXRi's built-in Skyport wireless control and triggering system, because it lets me change power and lighting ratios right from the top of my camera (no more climbing up ladders, or pulling down booms, or getting out of "the zone" just to make a simple adjustment). I do all right from my camera position, and it saves a ton of time, frustration, and money.

Skyport has saved my butt on more than one occasion and honestly, now that I have this type of control I just couldn't go back just being able to pop the lights. The BXRi's with the built-in Skyports have changed everything, and that's why I tell all my friends who are photographers - you gotta go Elinchrom. I love my BXRi's, they just flat out rock!

Photoshop was not used to place any elements in this image. Learn more about cameras, photography, Photoshop, Lightroom and many other photography related topics at www.scottkelby.com

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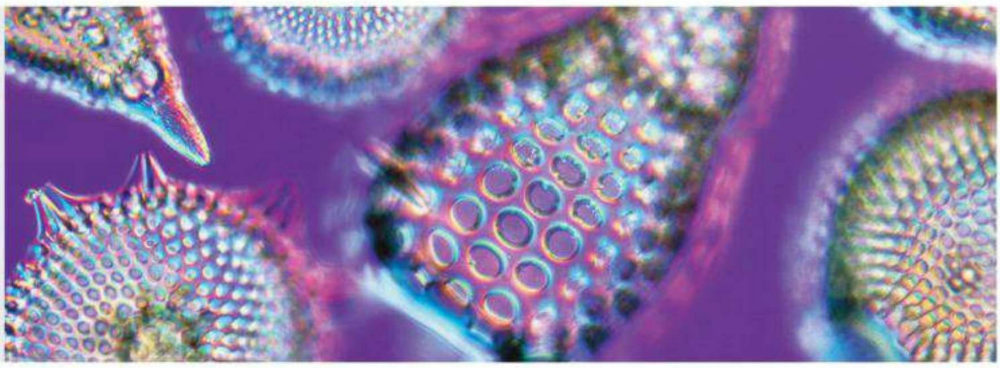

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DONALD MIRALLE (DIVERS); ALFRED PASIEKA (MICRO)

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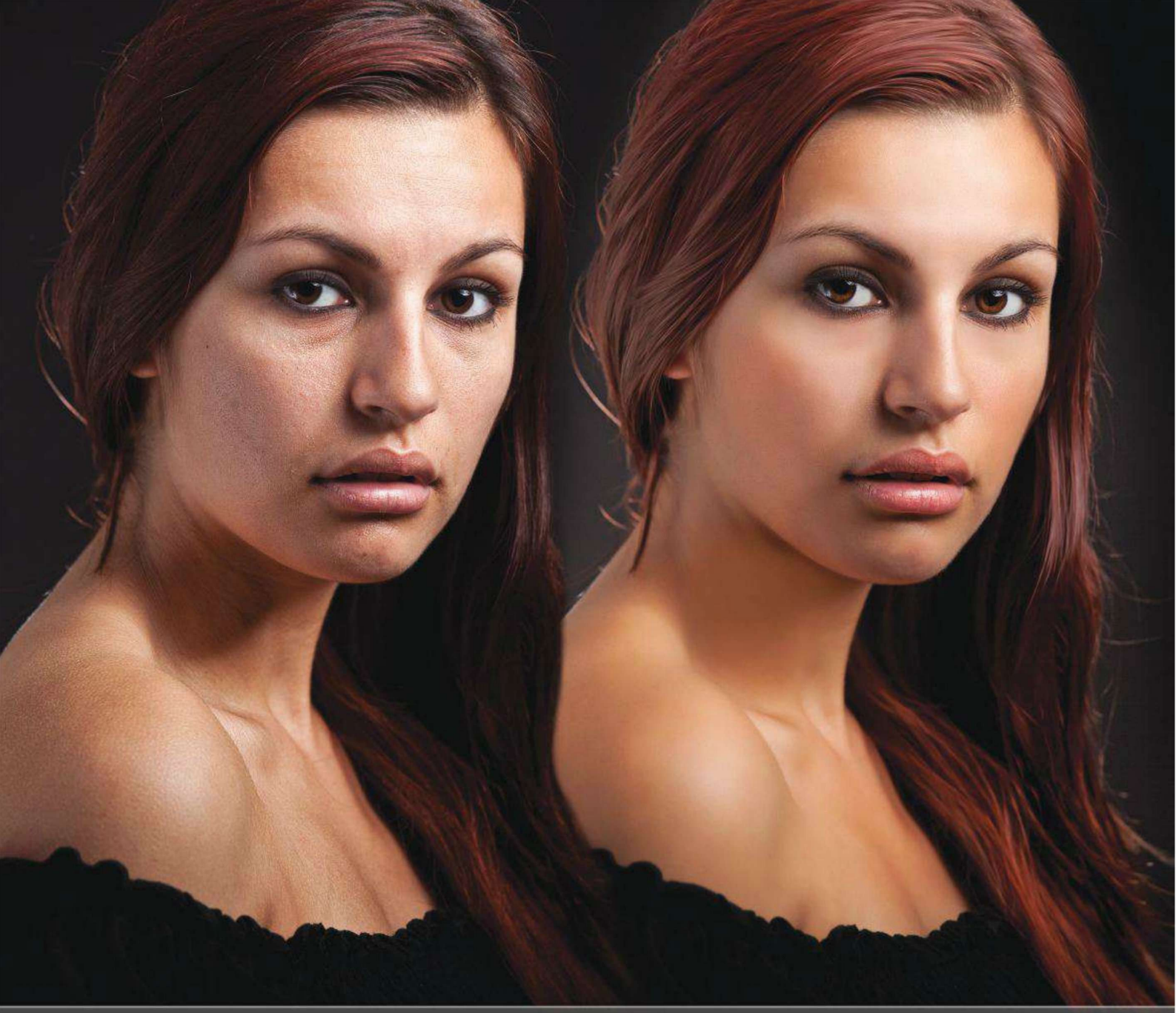

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EDITOR'S LETTER

Get Your Game On

Chances are you're not going to London for this summer's Olympics. The closest I'll get? When I'm holding my iPad. But even if you do have tickets to the events, getting the kinds of iconic shots you'll find in our feature story, "Shooting the Gold Rush," (page 60), and in the July/August issue of our sister magazine, *American Photo*, will be all but impossible.

One reason, of course, is access. The photographers we showcase all had official credentials for the past two summer Olympic games, which afforded them unique vantage points. They clamped cameras to the rafters for overhead shots and took up positions on the ground for eye-level views of athletes. These angles you can't get from the stands, though at less-popular Olympic events you may be lucky enough (or well enough connected) to get great seats or a measure of mobility.

Still, you can put these same techniques to work for you in photographing sporting events to which you do have access—those held by school teams, amateur leagues, athletic clubs, and the like. And for events that don't let you get closer to the action than the stands permit, take creative advantage of the situation: Photograph the fans, the venue, the wider context of the sport.

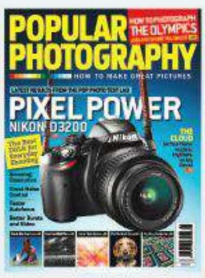
Another factor is gear. Not only can these pros bring more equipment to each venue than a fan in the stands can, but they use higher-performance cameras and lenses than most of us own. But these big-time shooters don't necessarily own this gear, either—they borrow some of it from manufacturers, right on the premises. (In "Gear Run," page 68, we give a brief rundown of the stuff professional Olympics shooters require, along with solid alternatives for the rest of us.)

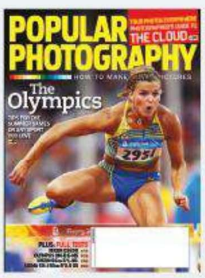
Even if you own all the right stuff, don't bother hauling it to London for the games. Lenses more than 11.8 inches (30cm) in length, along with tripods and monopods, are banned, although some venues may bend the rules, depending on the space. Of course, other sports organizations enforce similar restrictions. Try to get a fully loaded camera bag into Yankee Stadium, and you'll see what I mean.

Finally, there's the matter of skill and experience. The veteran sports photographers we spoke with have these in spades, as well an eye for emotion and visual storytelling. Luckily, with enough practice and dedication, and a smidgeon of talent, you can develop the chops.

But don't try to sell the great photos you do manage to shoot—commercial use of Olympic imagery is strictly controlled. A few of the pros who shot the 2004 and 2008 summer games expressed frustration at being locked out of the action this year. And the International Olympic Committee bans ticket-holders from posting images on social networks, though it has backed off this unenforceable position. After all, why take a photo you can't share?

Miriam Leuchter





NEWSSTAND A stellar machine for everyday shooting, Nikon's entry-level D3200 offers the best image quality in its class. See why on on page 73. Photo by Satoshi.

SUBSCRIBER Streeter Lecka of Getty Images caught Sweden's Susanna Kallur hurdling in the 2008 Olympics in Beijing. Get his insights and more on page 60.

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SAMANTHA KELLY

RAISE THE RED LANTERN

While exploring New York's Chinatown, our intern Samantha Kelly spotted these paper lanterns hanging in a storefront. With Nikon's 85mm f/1.8G AF-S Nikkor lens on a Nikon D800, she opened up the aperture to f/2.8 for some creamy *bokeh* and snapped this exposure at 1/160 sec. Back at the office, she added brightness and contrast in Adobe Photoshop CS5. For our lab and field test of this fast, full-frame lens, **see page 82.**

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NEXT

THE HOTTEST NEW STUFF AND THE TECHNOLOGY TRENDS BEHIND IT

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WE WANT THIS

SATOSHI

MOVIE REBEL

The latest Reb ramps up the video experience

WE JOKE about our annual "Best Rebel Yet!" headline, but, well, Canon has done it again. The major upgrades on the T4i are for video, but still shooters will find new goodies to love, too.

While its new 18MP CMOS sensor matches the T3i in pixels, it has a phase-detection sensor embedded in the center, plus a contrast-detection zone covering most of the frame. This forms a hybrid AF system that, in conjunction with Canon's new STM lenses (see page 20), enables continuous AF during live view and video. There's a built in stereo mic, plus a stereo mic input, too.

The Digic 5 processor, said by Canon to be five times as fast as the Digic 4 in the T3i, boosts the still burst rate to 5 frames per sec from 3.7, and ISOs go to a high of 25,600 rather than 12,800. The conventional AF system is similar to the one found in the EOS 60D, with nine AF points, all cross-type.

And the 3-inch, 1.04-million-dot, tilt/swivel LCD is now a touchscreen—a first for Canon DSLRs. Touch the image of a face, and it will track it around the frame in live view or video.

CANON EOS REBEL T4i

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usa.canon.com

BIG CHIP

Sony's pocketable advanced compact has a new sensor

ADVANCED compacts may be cutting-edge, but the cameras that allow plenty of manual control, shoot high ISOs, and record RAW files are rarely as compact as most photographers would like.

Sony has faced this issue head-on, creating a new 1-inch sensor and putting it in a body that's truly pocket-sized at just 4 inches wide.

The Cyber-shot RX100's 20.2MP sensor is coupled with the BIONZ image processor, so it captures in RAW at ISOs up to 25,600. There's a control ring around the lens as well as a wheel in the back, making full manual control simpler. Bursts top out at 10 fps at full resolution, and the 3.6X Carl Zeiss Vario-Sonnar T* zoom lens opens to f/1.8 at its widest 28mm (equivalent) focal length and reaches a respectable f/4.9 at 100mm. At 50mm, the maximum aperture is a decent f/2.8.

Of course, it records video, too. The RX100 captures at up to 1920x1080p60. This is one small shooter that we can't wait to test.

Sony Cyber-shot DSC-RX100
$648, street
www.sony.com

NEWS FEED

> Sekonic just released its L-308DC DigiCineMate light meter with an orange protective skin. Its user-friendly readout and three different ways to meter and measure light make it great for DSLR videographers.

> The reverse image-search website TinEye has competition from the "Search by Image" extension for Google's Chrome browser. This allows you to locate a picture online or find variations with two clicks.

> A Canadian man is suing Apple because his Time Capsule drive died, taking his photos with it. We're no lawyers, but we recommend using external drives for backup only, never for long-term storage.

SCREEN STAR

A dazzling display

WITH A screen resolution of 2880x1800 pixels, Apple's new 15-inch MacBook Pro packs four times the pixels into a monitor with the same dimensions as the old one. Viewing images on it is like scoping slides on a lightbox—clear and crisp. You really get what this means when you open a 36MP RAW portrait and zoom in to 100%. On a typical 15-inch screen you'd expect to see, say, an eye, but with this display, you see a whole face. Suddenly a 36.3MP file isn't giant, just appropriate.

The notebook is thin and light, takes up to 16GB of RAM, and uses a solid state drive, which means speedy booting, if little storage space. For shooting tethered and editing in the field, this will be a dream machine.

Sure, it's missing such niceties as a DVD slot and Ethernet port, but Apple has adapters for these. (And we'd recommend them—imagine downloading the whole Adobe Creative Suite over Wi-Fi.)

Apple MacBook Pro with Retina display
$2,199, street
www.apple.com

INSIDE TECH

Real D.O.F.

Ever wonder why you've never been able to get great background blur and truly shallow depth of field with a compact camera, even an advanced one? It's probably because the sensor in most compacts just isn't large enough. With the new RX-100, Sony has paired a Zeiss T*lens that shoots a fast f/1.8 at its widest angles with a new, larger 1-inch-type image sensor. The result? Actual shallow focus from a compact.

SIGMA

Sunflower | CAMERA : SIGMA SD14 : ISO50, F8, 1/13sec | LENS: SIGMA 85mm F1.4 EX DG HSM : 85mm | Copyright© 2010 Paul Thacker

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A BETTER ZOOM

Sigma's new tele is easier to carry with you

WHEN IT comes to lenses, smaller and lighter is always welcome news. As other lensmakers have recently done, Sigma has tweaked a popular lens to make it ever more portable. The new 18–250mm F/3.5–6.3 DC Macro OS HSM Zoom Lens is made from the new TSC (Thermally Stable Composite) material that allows for both a smaller form factor and better protection from temperature changes. This could mean that the lens will maintain its sharpness across a longer time period, especially for users living in areas with wide temperature shifts. (Theoretically, the more times the barrel expands and contracts, the looser the elements can become, ultimately leading to softer images.) Also note the new "macro" function, with a decent 1:2.9 ratio.

Sigma 18–250mm f/3.5–6.3 DC Macro OS HSM $499, street www.sigmaphoto.com

DIVE READY

A top tough camera goes deep with accessory optics

THE LATEST flagship, all-weather, rugged compact from Olympus, the new 12MP Tough TG-1, brings upgrades in all the right places: waterproof to 39 feet, cold-resistant to 14°F, crushproof to 220 pounds, with a new manometer and the TruePic VI image processor previously found only in Oly's DSLRs. But it's the optics that make this underwater-friendly shooter intriguing. Its f/2.0–4.9 lens works with two waterproof accessory lenses, a fisheye and a 170mm teleconverter, which might make you rethink that DLSR housing. A 0.4-inch (1cm) focusing distance lets you shoot insanely close, and the backlit CMOS sensor design could mean bigger pixels for higher sensitivity and less noise.

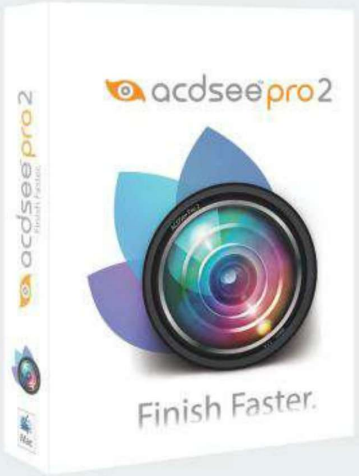
Olympus Tough TG-1 iHS
$399, street
olympusamerica.com

NEWS FEED

> It's the rare photographer who backs up manually, so systems keep popping up to help. Seagate's latest Backup Plus drives work for Windows and Apple, come with software for one-click archiving, and even back up from Flickr and Facebook.

> Satechi has a new wireless camera remote for Canon. Inexpensive at $60, it can fire the camera at intervals, for long exposures, or to take a single, normal shot.

> Nokia's $699, 41MP (with 5–8MP output), 808 PureView smartphone is now available unlocked and unsubsidized via Amazon.com. It works on either AT&T or T-Mobile.



ACDSee Pro 2

An alternative editing app for Mac users

ACDSee's editor/organizers have long been a favorite of PC users for their speedy image display and database-free organizational system. Now Mac devotees who want a simple, streamlined editor that excels at sorting have an improved option. ACDSee Pro 2 ($140, direct; acdsee.com) is great at batch processing and searching. And it now comes with 10GB of free cloud storage for backup and sharing.

THE LOWDOWN

SCREENS OF THE FUTURE

The Society for Information Display's conference this summer presented some cool new stuff. LG showed a 5-inch, 440ppi display (the iPhone 4's is 326ppi) that will be available by the end of the year. And Corning had the flexible Willow Glass, which, at 0.1mm thick, can be printed with electronics in a roll process, making it cheap and versatile—think large, curved displays.

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the 2012 election: a photo challenge

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This year, Americans will once again be asked to decide who will lead our country for the next four years. With campaigns stretching from the largest cities to the smallest towns, Americans will come out in droves to take part in it and have their voice heard. Since photography is the one true universal language, Sony, *Popular Photography* and *American Photo* are challenging our nation to document this historic election year with pictures. Sony's Artisans of Imagery, as well as the population at large are invited to participate. With the ability to capture moments in time and tell a story without narrative, no medium is more powerful than photography.

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The 2012 Election: A Photo Challenge is sponsored by Popular Photography magazine, and is open to residents of the 50 United States and the District of Columbia, ages 18 and up. No purchase necessary to enter, void where prohibited by law. To enter and for complete Official Rules, visit www.popphoto.com/sonycontest between April 25, 2012 and September 2, 2012.

TIED ON

SMART STRAPS Camera holders like this BlackRapid Sport-L make shooting smoother.

EVER given much thought to your camera strap? If not, consider how much more efficient and comfortable shooting can be with the right device. Strap technology has exploded lately, from systems that let you secure your camera comfortably around your wrist (no more winding a neck strap up your arm) to those that let you hang cameras from your belt for fast access. Chances are one of these will improve upon the strap that came with your camera.

Clik Elite Wrist Strap $18 Great straps don't have to be pricey. Clik Elite's padded, breathable wrist strap is the perfect option for shooters who never want to carry a camera around their neck. The weight of the camera makes the strap tighten when it dangles from your wrist but loosen up when you shoot.

Custom SLR Split Strap $29 This ergonomic offering comes with two pairs of adjustable ends, so you can make the strap the right length whether you wear it cross-body or around your neck. The wide band keeps it comfortable and the split helps it breathe; silicone on the inside prevents it from sliding.

Black Rapid RS Sport-L $70 Most straps are made for both shoulders, but southpaws will dig this specially made strap (there's one for righties, too). The wide band fits over your shoulder and secures with an underarm tether. Stops keep your camera, hanging from its tripod socket, from sliding until you need it.

Cotton Carrier Carry-Lite $109 For photographers who want to avoid back and neck strain or who want to look less intimidating working an event with a big camera rig, a belt and holster system is ideal. Cotton Carrier's has a cross-body strap for extra support and a leash to keep the camera tethered while shooting.

SpiderPro Dual Camera System $235 This system is built for toting two cameras, one on each hip. Attaching the aluminum alloy plates to your camera's tripod socket won't impede vertical shooting, plus the plates fit your tripod's quick-release plate. Locks keep the cameras secure.

NEWS FEED

> A new app, Woven, for iOS, Android, and e-readers lets you view pictures from Flickr, Facebook, and other photo-sharing sites all together.

> Outdoor experts recommend silica gel for moisture absorption in humid climes and for rapid switching between shooting temperatures. SeaLife's new Moisture Muncher packets and capsules can help soak up the wet.

> Dear Photograph, a website dedicated to juxtaposing old and present-day photos shot in the same place, celebrates its first anniversary by releasing a book.

> Protect your portable data when disaster strikes with Verbatim's new water-, dust-, and elecrostatic-resistant USB drive. Available with 4GB to 32GB of storage and in seven colors.

TOOLBOX

RING ON IT

An LED ring light that shoots with any DSLR

PORTRAITISTS love Rosco's LitePad line for its soft, low-contrast light. Rosco has now added the Loop—a ring light that casts even illumination around faces and macro subjects. The hot-shoe-independent accessory ($699, direct; rosco.com) doesn't communicate with your camera, so you can use it with any body or lens model. A tripod mount secures the rig to the camera, and the magnetic mounting system allows it to quickly attach to and detach from the base. The battery mount easily fits Anton Bauer and V-Mount batteries, but also accommodates a AA adapter.

60%

of American digital camera users back up and store their photos on CDs and DVDs.

7%

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SOURCE: INFOTRENDS 2012

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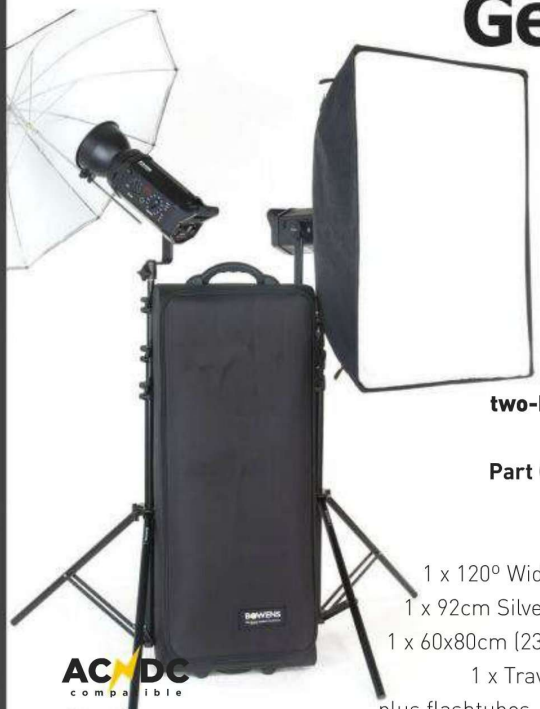
Gemini



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MOTION GLASS

Interchangeable lenses become video masters

Two new lenses from Canon and one each from Panasonic and Rokinon boast features that especially suit them to shooting movies.

DSLR CAMERA makers jumped into video a few years back, but their lenses and focusing systems weren't quite video-ready. Sony was first to address the problem with its semi-transparent mirror and continuous autofocus during video capture. Now, Canon and Panasonic present new video autofocusing AF solutions, while lensmakers such as Rokinon and Zeiss go retro with manual focus.

Canon's new EOS Rebel 4Ti is its first body to offer continuous AF in video, thanks, in part, to STM "stepping" motors built into two newly video-optimized lenses. Used with Canon's new Movie Servo AF, the STM motors provide relatively smooth, quick, quiet, sure, and continuous AF for both live view and video. They do this using a hybrid combination of conventional contrast-detection pixels with a new form of sensor-based, phase-detection pixels.

Canon's first STMers include the EF-S 18–135mm f/3.5–5.6 IS STM and its first pancake lens, the EF 40mm f/2.8 STM. The former offers a new Dynamic IS shake-reduction system that, when used in the movie mode, is claimed—like a SteadyCam—to stabilize video capture, even during walking takes.

Panasonic was the first still-camera maker to get into stepping motors, borrowing them from its line of camcorders. Its new power-zooming 14–42mm f/3.5–5.6 and 45–175mm f/4–5.6 OIS lenses for Lumix interchangeable-lens compact cameras have them. And so does the new, pro-grade Lumix G X Vario 12–35mm f/2.8 ASPH.

Panasonic says that its motors find focus more rapidly, smoothly, and quietly than conventional AF motors. And the camera bodies customize the electronic pulses that they send to the lenses, depending on whether the bodies are set for video or still capture.

Rokinon's prime lenses are well suited to video, thanks to smooth, quiet manual focus. But the company goes further with its first DSLR Cine lens, an 8mm T/3.5 fisheye for APS-C bodies. It is almost identical to an earlier 8mm f/3.5, but built for video.

Rokinon says that its continuously settable, "declicked" aperture ring affords glitchless fade-outs and more subtle changes in exposure than are possible with click-stopped apertures. And its geared focusing ring mates with follow-focus rigs by iDC and others to more smoothly change (or "pull") focus while shooting than is possible with a regular MF ring. The apertures are marked as cinematic T-stops, although for DSLR purposes, f- and T-stops are synonymous. *—Peter Kolonia*

Canon 18–135mm f/3.5–5.6 EF-S IS STM	Canon 40mm f/2.8 EF STM	Panasonic Lumix G X Vario 12–35mm f/2.8	Rokinon 8mm T/3.5 Cine Fisheye
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www.usa.canon.com	www.usa.canon.com	www.panasonic.net	www.rokinon.com

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November 9–11, 2012

Strung from the tip of the Florida peninsula like the last pearl on a string, Key West blends together the best of mainland and island life at the southernmost tip of the continental U.S. In just three days, Nikon professional photographers Bill Durrence and Layne Kennedy will increase your knowledge of photography and fine-tune your skills, whether aboard a seaplane, amid a secret garden or at the pier as the sun sinks into the horizon. Don't miss this once-in-a-lifetime opportunity to unlock your potential in Key West.

Migratory birds flock to the Key West Wildlife Center and you will too as the wildlife sanctuary is the first stop on our trek. Walk the paved trail through the park and focus on flora and fauna. Turn from nature to tradition at the Key West Cigar Company. Frame portraits of local cigar makers in action before heading to Mallory Square to capture perhaps the most celebrated Key West event—the sun setting over the harbor and Gulf of Mexico.

Day two begins in a new light—literally—shooting sunrise at palm tree-lined Smathers Beach. You'll need your lens and a sense of adventure during a seaplane ride to Fort Jefferson. The airborne craft will glide at a low altitude of 500 feet, allowing you the chance to photograph rays, porpoises and sea turtles in the shallow, crystal clear waters below. But that's just the beginning: Snorkel with Nikon's waterproof COOLPIX AW100 in the afternoon before ending the day with a digital review session with your mentor.

Located in the heart of the city, Nancy's Secret Garden is an oasis in paradise and the first stop on day three. In a backdrop as lush and dense as a tropical rainforest, focus your camera on an array of stunning orchids and vibrant macaws. A walking tour of the city gives you the chance to turn your lens on the historic landmarks and distinctive architecture that define the Conch Republic.

Follow your passion for photography to Key West. Sign up today!

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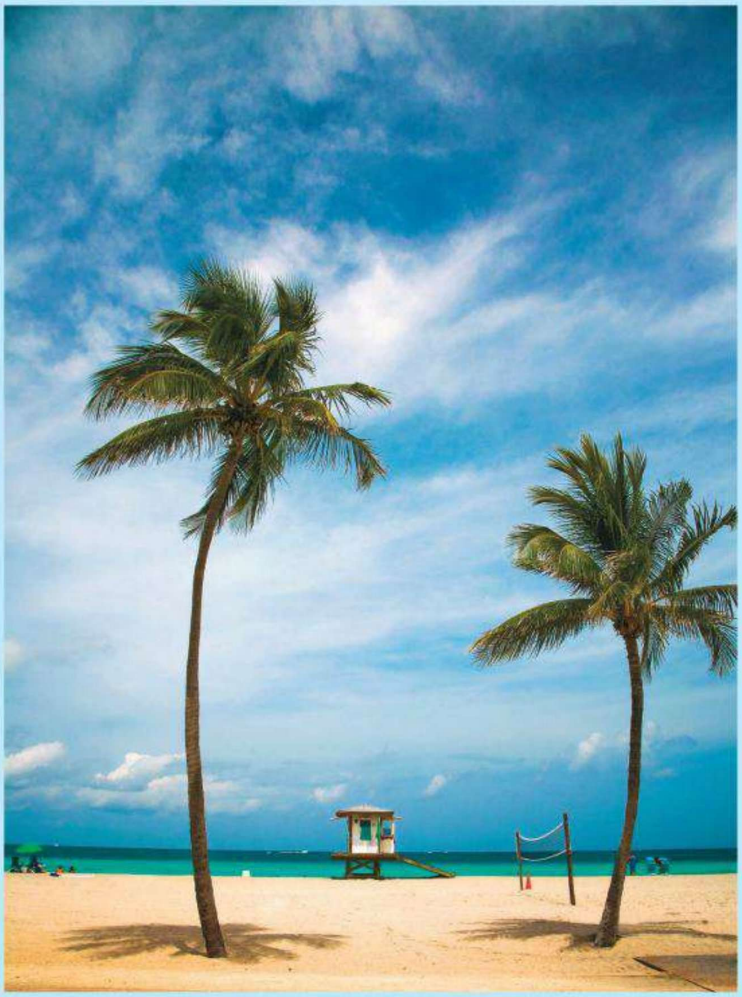

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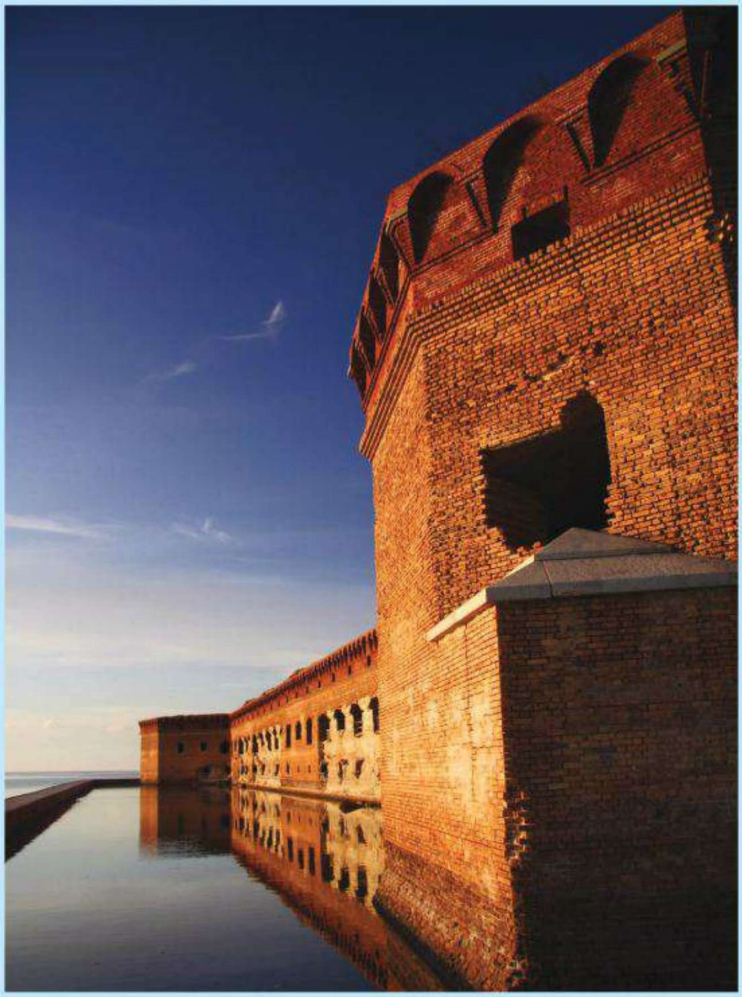

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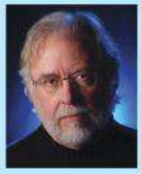

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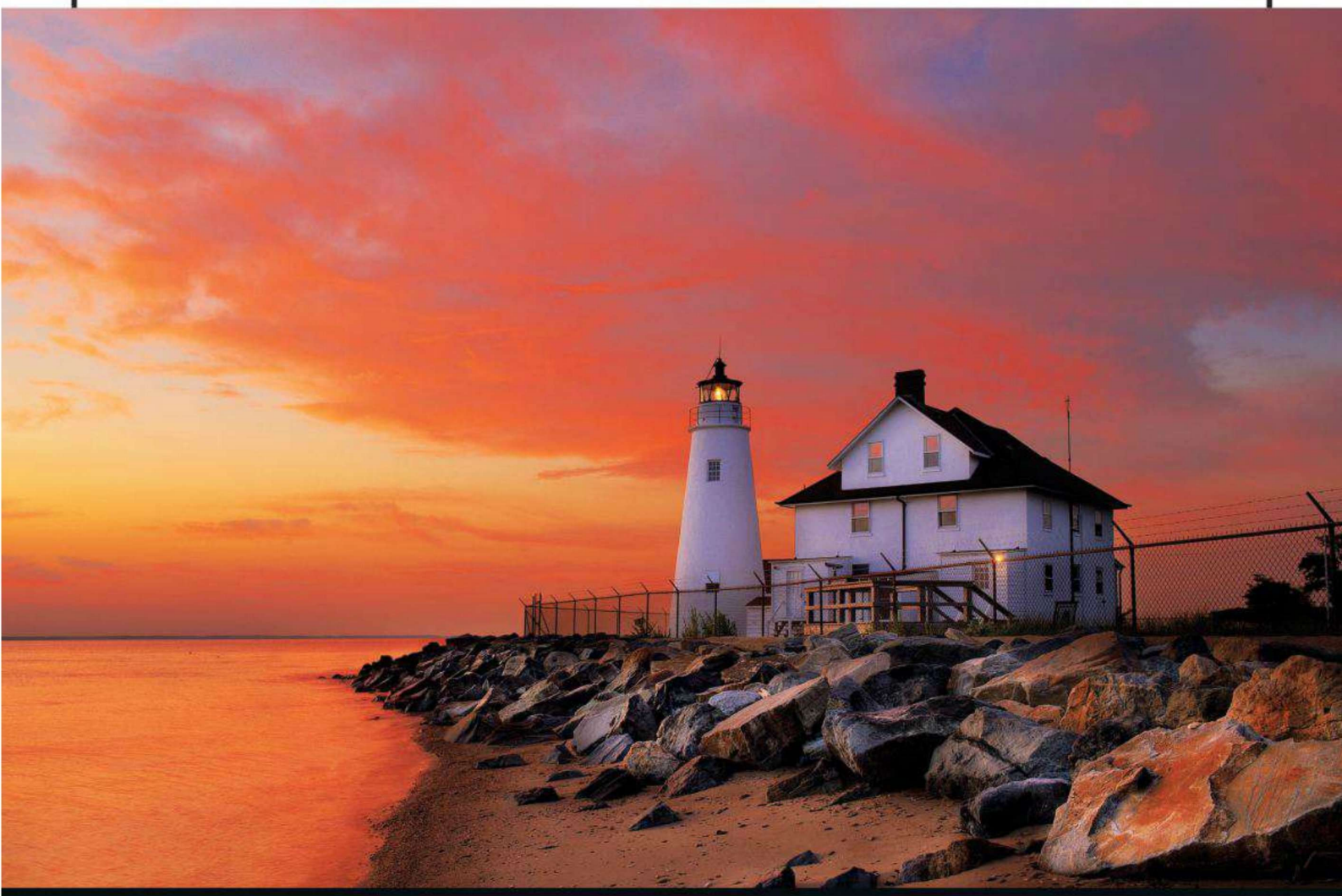

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Cove Point Lighthouse photo © Ferrell McCollough

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PHOTO CHALLENGE

FUNGI FIREFIGHT

Sci-fi monsters inspire a miniature invasion scene

IT HAD BEEN a wet month, and caps, stems, and spores littered Owen Strzelewicz's backyard. The 46-year-old self-proclaimed (and self-employed) "Idea Man" was picking mushrooms, hoping to save his curious pooch from a bellyache. Noticing clusters of the eukaryotes, the Ferndale, MI, resident had flashbacks to the sci-fi movies from the '40s and '50s, and imagined giant fungi terrorizing the populace. So he decided to send in the troops.

With his Pentax K-5 on a Vanguard Alta tripod, Strzelewicz zoomed his kit lens to 18mm to document the toy soldiers' *coup de main*. He had no trouble freezing the action, despite the relatively slow (1/20 sec at f/4.5, ISO 100) exposure. Using nothing but the sun and a $7 clamp light for fill, his homemade battlefield answered our challenge to build your own subject.

—Matthew Ismael Ruiz

For more examples of Strzelewicz's ideas in action, visit www.one-39.com.

OWEN STRZELEWICZ

NEXT PHOTO CHALLENGE **In Quick Tip (page 44), Eric Rolph captures a bittersweet portrait window scene. Send us your best indoor/outdoor window portrait by August 31; you could win $100 and your photo here. For rules: PopPhoto.com/contests.**

White Boards

Blanking out the billboards

"I LOVE advertising, but something about roadside billboards makes me think about how awkward they are," says photographer Ty Cole. "In locations around I-65 in Alabama, they don't fit into the natural surroundings—they're often at odds with the nearby landscape."

Cole, an Alabama native who has lived and worked in New York City for several years, first noticed this on a road trip down south in 2008 to visit his friends and family. Driving along the route towards his hometown of Decatur, he passed billboard after billboard. He was struck by the strangeness of the sight, enough to pull over by the side of the road and set up his tripod-mounted 4x5 Toyo-View camera. "The structures seemed as if they didn't belong against the

TY COLE (5)

Ty Cole is a commercial and editorial pro based in New York City. See more at tycole.com

Cole used a Toyo-View 4x5 camera with 135mm and 210mm lenses, making long exposures on Kodak Portra NC400 film.

landscape, and though I love advertising, I wanted to capture that sense of displacement."

A longtime fan of photographer Hiroshi Sugimoto, particularly of the artist's work depicting blown-out screens in movie theaters, Cole decided to use his work as inspiration, exposing for the landscape and allowing the billboards to overexpose to white.

Later, reviewing his negatives, Cole realized that he was onto something. For the rest of the trip—and on subsequent trips to Alabama—he'd pull over to the roadside when a sign caught his eye, composing to let its strangeness set it apart from the surrounding landscape. At home, he'd scan and postprocess when needed to remove remaining graphic elements from the ads.

What stood out most to Cole was not the billboards as objects, but their proximity in places that, uncut by interstates, would seem untouched. Now, when driving through locations where tall signs are prohibited, he appreciates their absence more—just as he appreciates the project born from his awareness of billboards.

"You'll see signs like this nearly everywhere, and you can pass them without thought, though the message sinks in," he explains. "It's only when they stick out against their landscape that you realize that something about them doesn't quite belong."

—Lori Fredrickson

DANIEL RUSSO, DANIELRUSSOPHOTOGRAPHY.COM

Surf Survivor

Mike Coots loses a leg, gains a career

His dreams of a surfing career dashed by a rogue shark, Hawaii-based beach lifestyle and surf photographer Mike Coots is now an advocate for their survival. For more of his story (and those of other survivor/advocates), tune into the Discovery Channel during Shark Week, starting August 12.

Describe the shark attack. I was out with friends at a surf spot. The shark attacked me from underneath, latched onto my legs, and started swinging back and forth. I stuck my right hand in its mouth—with my left hand, I punched it in the head. It let go, sunk back underwater, and disappeared. I looked over my shoulder and saw my leg completely sliced off—a surgeon couldn't have done a better job. When I came to, it was a day later. But as soon as I got the stitches and staples taken out of my other leg—I almost lost that leg, too—I was back surfing.

How did the shark bite lead you to photography? A lot of magazines and newspapers were coming over to do stories on me. John Russell was one of them, and I just hit it off with him. When he had a shoot on Kauai for *Sports Illustrated KIDS*, he called: "You're the only one I know on the island. Would you like to come along and assist me?" He became my mentor. I spent a lot of time at the beach shooting my friends (who were all pro surfers), often shooting them wearing clothes they got from their sponsors. I started submitting stuff to the sponsors, and it grew from there. Now I do work for Quiksilver's underwear line and a lot of environmental portraiture in Los Angeles.

Did photography help you reconnect with the ocean? I was born and raised in Hawaii. The ocean is everything to everybody here. I saw these different elements unfolding—the moments when the light hits the water a certain way, or the way the waves break against this stunning backdrop. I wished I could tell the stories to my parents or my friends who weren't in the ocean. I fell in love with telling that story.

In the water, what does it take to get the perfect shot? For high-impact action surf stuff, good talent: Great surfers, before I go out and surf with them, know to ask what equipment I'm using, whether it's a fisheye or a wide-angle or a long lens, and know exactly where to set themselves up for that maneuver. More than good light or good waves, that's the best thing to have—good talent.

Do you ever feel fear? Of a shark attacking me, not at all. The odds of that happening again are so slim. It's more about the physical limitations that I have. I swim with my prosthetic on, and I only have one swim fin. My prosthetic isn't quite an anchor, but it doesn't help at all. It drags water. It's harder for me to get in huge surf with crazy currents, but it's forced me to read the ocean better and visualize where it'll set me up and where I'm going to come in, whether it's rocky cliffs or sharp reefs—the best entry and exit points. And I'm still trying to tinker around with my leg and different ways of putting up swim fins along my prosthetic to give me a little advantage. It's kind of a learning process.

Talk about your gear. Waves are really hollow—you want to try and get a shot of the surfer inside the curl. Canon's 15mm f/2.8 fisheye is the best; it makes really tight little barrel shots seem bigger. It also totally exaggerates your distance—if you're 4 feet away, you're too far. If the waves aren't perfect and it's a little mushier, I use a longer lens and sit on the shoulder to get a tight action shot. I shoot a lot off a personal watercraft (PWC), and I keep a 70–200mm f/2.8L Canon IS in a Pelican case. I use a Canon EOS 5D Mark II for lifestyle work; for action, I use an EOS-1D Mark IIN in an Essex Housing—they have fewer wingnuts to screw

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The distinctive lustrous finish of Sigma EX lenses denotes that each was created to provide professional-grade performance, design and construction. DG digital design is made for full frame but also compatible with APS-C-format DSLRs. Cutting-edge multi-coating delivers brilliant flare-free imaging and even light distribution. Hyper-Sonic Motors (HSM) provide ultra-precise, virtually silent high-speed AF. All EX lenses incorporate advanced technology such as special ELD (Extraordinary Low Dispersion), SLD (Super Low Dispersion) and FLD (Fluorite Equivalent) glass, and aspheric elements, as required to attain exceptional sharpness, brilliance and color correction. All work together to create a versatile and professional package.

Sigma pro Lindsay Adler relies on Sigma EX lenses to capture her creative vision.

SIGMA 50MM F/1.4 EX DG HSM

This exquisite high-speed prime lens is a great all-rounder that's perfect for low-light and night shooting. It's also a superb 80mm-equivalent portrait lens for APS-C-format DSLRs. Its ultra-wide aperture delivers a brilliant viewing image and very shallow depth of field for creating beautiful pictorial effects. Its advanced optical design delivers outstanding sharpness and contrast at all apertures.

SIGMA 85MM F/1.4 EX DG HSM

A classic super-speed portrait lens, it provides extremely shallow depth of field and gorgeous out-of-focus backgrounds and foregrounds to make subjects pop. It's also great for sports, providing a 135mm-equivalent telephoto on APS-C-format DSLRs. Its cutting-edge design and efficient multi-coating yields exceptional sharpness, contrast and color correction across the field.

SIGMA 24-70MM F/2.8 IF EX DG HSM

Covering the wide-to-moderate-telephoto range prized by pros, its large f/2.8 constant aperture assures brilliant viewing, low-light capability and shallow depth-of field for compelling portraits. This handy, high-performance mid-range zoom incorporates one ELD element, two SLD elements, three aspheric elements and internal focusing (IF) to deliver the highest level of color correction and image quality.

SIGMA 70-200MM F/2.8 EX DG APO OS HSM

Beautifully crafted, this f/2.8 constant-aperture, long-range tele-zoom incorporates Sigma's Optical Stabilization (OS), providing a four-stop anti-shake advantage. Cutting-edge apochromatic (APO) design delivers unsurpassed sharpness and color correction over its extended zoom range plus an amazing 109-310mm-equivalent range with APS-C-format cameras.

SIGMA 120-300MM F/2.8 EX DG OS APO HSM

The quintessential ultra-long-range telephoto zoom for pros, this super-speed f/2.8 constant aperture masterpiece is unequaled for covering sports, wildlife and adventure. It features Sigma's Optical Stabilization (OS) for shake-free results in the field, and its advanced apochromatic (APO) design delivers the highest level of color correction for unsurpassed imaging performance.

SIGMA

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and unscrew when I'm changing lenses or settings. There's a focus lock that helps a lot, because in the water you go up and down, and the focus goes all over the place.

How is shooting on a PWC? The most crucial thing is definitely keeping an eye on the incoming surf. Not the guy riding the wave, but the wave that's going to hit the PWC. When you go to shoot, you're looking through the camera, not at where the wave is coming at you. You take your eye off the ocean for a second to shoot, always aware of what's behind and around you. It's a juggling act. I've had a top surfer take off on a beautiful wave that I know is going to be an amazing shot, but there's a small side wave about to hit the PWC, and I can't take it because I need to maneuver around the waves. Safety first.

See more of his work at mikecoots.com and at PopPhoto.com/coots, where you'll also find an expanded version of this interview.

What got you into conservation? I got a phone call three years ago from the Pew Environment Group. I was absolutely blown away by what's going on, with like 70 million sharks a year dying for shark-fin soup. They thought using shark-attack survivors would be a good way to talk to Congress and the U.N. Sure enough, we were able to go to Washington, D.C. and New York City and tell them about what's going on in the oceans. It worked—we were able to get a shark ban in Hawaii, California, Washington, and New York City.

How can photography help conservation efforts? I think it's probably the single biggest thing that can help it. It visualizes this horror that's happening to sharks and lets the average person at the dinner table or watching the news or reading a magazine see what's going on and maybe take action. After being finned, they swim in little circles, and two days later they're on the bottom of the ocean floor, dead. It's just the worst way to die. Sharks are apex predators—they hold the whole ocean in check. If sharks go, then everything will start to fall out of whack.

Where would you be if the attack had never happened? I would probably be working at a restaurant, surfing—just trying to get by, like a lot of people in Hawaii. Getting bit by a shark has been a blessing in my life, 100 percent. I've been able to to meet a lot of wonderful people and experience a lot of really cool things, and it's helped my career immensely. I feel really fortunate.

—Interviewed by RJ Cubarrubia

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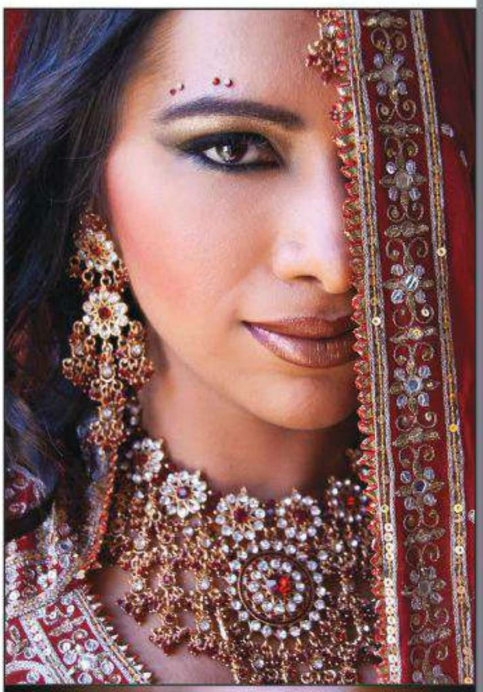


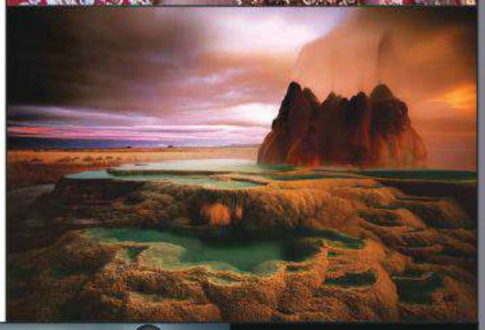
Categories

- ACTION/SPORTS
- ANIMALS
- CITIES/ARCHITECTURE
- LANDSCAPE/NATURE
- OBJECTS/STILL LIFE
- PEOPLE
- PEOPLE'S CHOICE - *PopPhoto* readers will vote for their favorite image! All entrants will automatically be entered in this category.

Submissions

The competition is open to work produced from June 2011—October 2012. All submitted artwork should be of reproduction quality.

ENTRY FEE: $10
DEADLINE: October 22, 2012



Credits (clockwise): Tamiz U. Rezvi, Rodney Lough Jr., Erich Chen, Ricardo Mejia, Kathy Hicks, Ricardo Pradilla

For a complete set of contest rules, prizes or to enter, please visit: **www.PopPhoto.com/readerscontest2012**

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The Readers' Contest, sponsored by *Popular Photography* magazine, a publication of Bonnier Corporation, is open only to individuals who are sixteen (16) years or older at time of entry, excluding residents of Cuba, Iran, North Korea, the province of Quebec, Sudan, Syria, and any other jurisdiction where this contest is prohibited by law. To enter and for complete Official Rules, visit http://www.popphoto.com/readerscontest2012 between May 14, 2012 and October 22, 2012.

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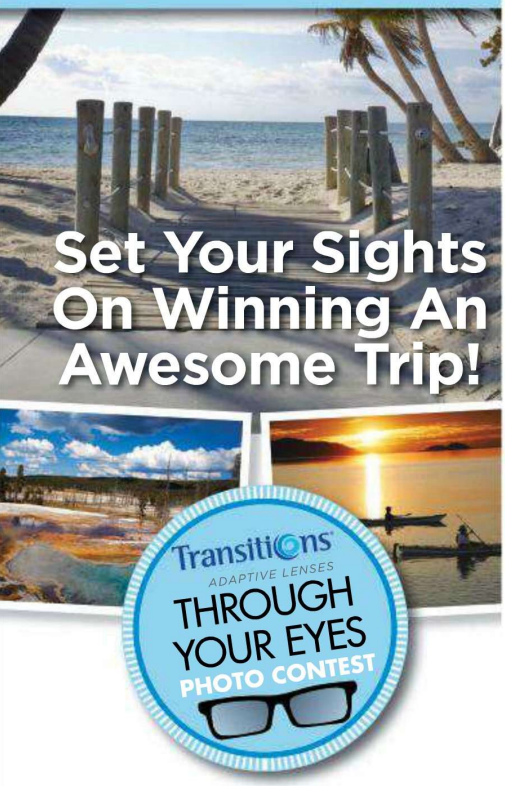

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To enter or see rules visit popsci.com/transitionscontest

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By Peter Kolonia
Wedding
State of Mind
As the ones responsible for capturing a wedding day in images, we photographers are under a ton of pressure. To help you next time you're asked (or even hired) to assume the role, we tapped ten exciting bridal pros—all chosen by our sister magazine, American Photo, as the best of 2012—for their techniques and strategies for bringing a smile to the face of even the scariest bridezilla.

SAMANTHA KELLY

Wet Wedding

Last weekend I attended a wedding as a guest, but—as always—with my camera (a Nikon D7000). When the beautiful day provided a heavy "sunshine rain," I was ready, having just read "Wedding State of Mind" (June 2012). As the newlyweds ran out into the downpour, dancing gleefully, I was ready to capture the moment. The couple immediately posted the image as their profile pic on Facebook. Before having read the article, I probably would have gone deeper into the tent to be sure I didn't get wet!

Don Douglas
Williamsburg, VA

I SEE that my blast (Letters, April 2012) at *Popular Photography* about "Crowd Funding" (February 2012) has been thought to be rather closed-minded (Letters, May and June). In a way, they are right, but only because I see *Popular Photography* as a more upscale magazine. Yes, I did read the article, and I have no problem with the article or the author's viewpoints. In fact, I agree with them. But I do not see why a "half peace sign" (or whatever creation someone wants to call it) is viewed as reasonable editing for the normal public. Of all the photos that could be printed for this article, why that? Would it not be considered in poor taste to post photos of a mangled or dead child? "Life isn't always a pretty sight," is correct, but does it truly bear value in that particular article? I believe there are a number of images that could have backed up the otherwise excellent piece. Looking back at my original letter, I was overreacting to the image posted. I truly did understand the article; I just didn't get the reason for the image itself. Otherwise, the author and photographer did a great job.

Ken Barbret
Rex, GA

I READ the two complaints (Letters, June 2012) concerning your decision to black-bar the lady's endowments in the May Time Exposure. It was the right decision. While we're all adults, you don't need to inch your way into popular exposure to maintain or increase your readership. BTW, I found your black-bar whimsically humorous in this age of show-it-all. You guys got class. ***Ron Sagnella***
West Chester, PA

UNLESS I AM hallucinating, the Backstory photo entitled "Water World" (June 2012) is upside down. The circular raindrop patterns in the puddles on the cobblestone street logically have to be at the bottom. ***R.S. Praus***
Enfield, CT

EDITOR'S NOTE: *Several of you accused us of having run James St. Laurent's photo upside down. We did not. In fact, the picture's disorienting surrealism, a comment on Prague, is what drew us to it from the start.*

POPULAR PHOTOGRAPHY

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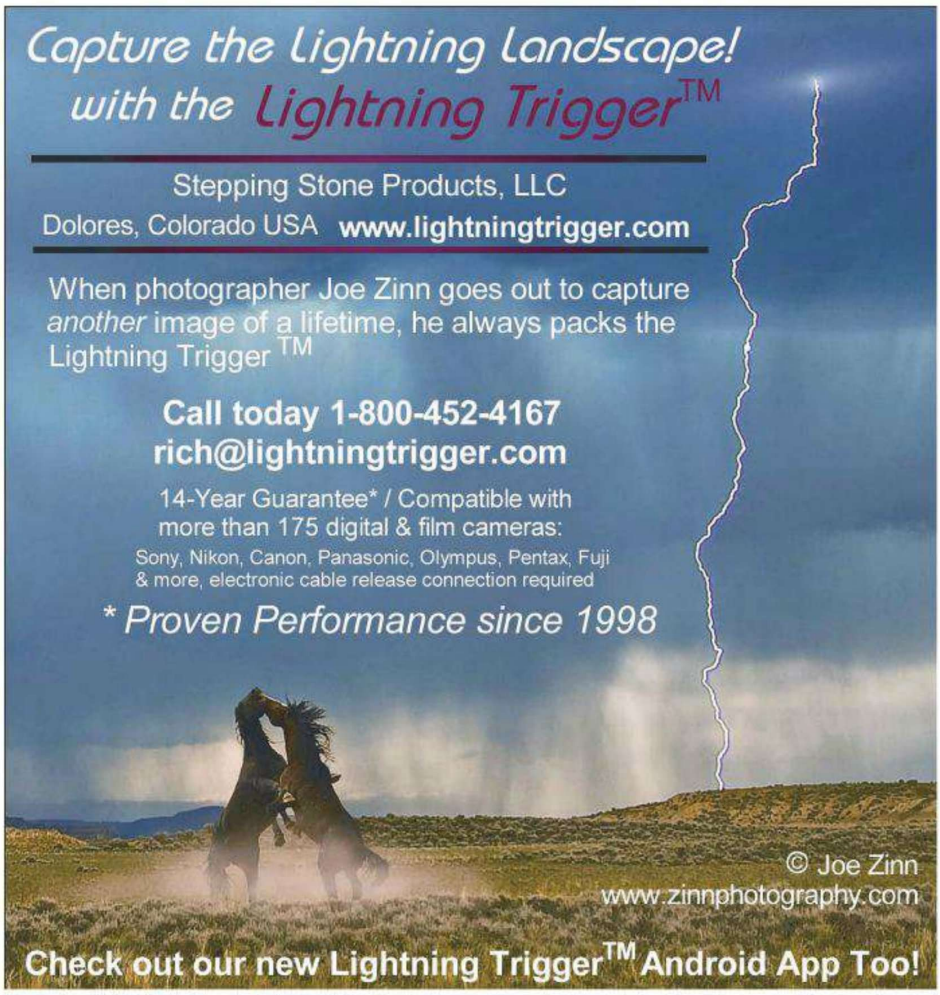
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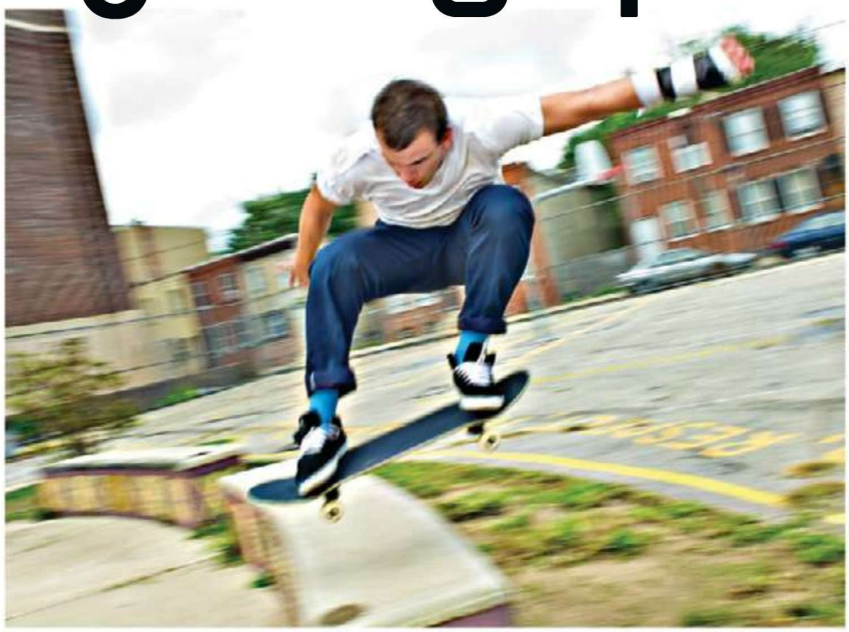
Syncing Up



DAN BRACAGLIA

He's sharp, yet blurred: A brief flash burst froze the motion during a slow 1/80 sec shutter speed, for a classic flash ghost.

FLASH SYNC is simple in principle: Flash must fire when the shutter is open to illuminate the scene. But two factors make it more complex.

One is electronic flash, whose burst is no longer than 1/1000 sec, and as short as 1/100,000 sec. So sync timing must be very precise.

Another is the focal-plane shutter, used universally on film and digital SLRs. When these shutters fire, the first of two curtains slides open to uncover the film or the sensor. At the end of the set shutter interval, the second curtain closes. For flash exposure, the camera's sync circuitry triggers the flash at the moment the first curtain is fully open.

But focal-plane shutters can fire only so fast. To produce faster shutter speeds, the gap between the curtains is narrowed so that only a slit travels across the imager. If the flash fires during this exposure, one of two things happens: Only a band of the film gets exposed by the flash (older cameras), or you don't get a flash exposure at all (newer cameras).

The fastest shutter speed that will expose the full frame to the flash on today's DSLRs is 1/180 sec to 1/250 sec, depending on model. Not very fast, and if there is movement in the frame, the ambient exposure can blur around the frozen flash exposure, a phenomenon called ghosting.

But wait! Most high-end accessory flashes for current and recent SLRs provide high-speed flash sync, which works by firing stroboscopic pulses as the shutter slit travels across the imager. Neat trick, and you can get flash sync at any speed—even 1/8000 sec. But maximum flash reach is seriously limited, as the full flash power is distributed over a lot of little pops.

So the best use for high-speed sync may be for fill in outdoor portraiture. This way, you can shoot wide open with that f/1.4 lens without a pile of ND filters, even in bright daylight.

Q&A

Cooking in RAW

Q I recall reading in your magazine some time ago that a JPEG image can be processed using Adobe Camera Raw (ACR), but I have yet to see instructions on how to process a JPEG image in ACR in Adobe Photoshop Elements. Could you let readers know exactly how this can be done? **M. Howard Vancouver, WA**

A *In Elements 10, once you highlight an image you want to open, make sure the drop-down Format menu is set to Camera Raw. Then hit Open, and it should drag your JPEG file into the ACR interface. The adjustments available to you will, of course, not be as high quality as those available for a RAW file, but if you like using the ACR interface (as we do, a lot), it's a great way to tweak JPEG files. By the way, if you have a current or recent version of the full Adobe Photoshop, you can edit a JPEG in ACR by right-clicking on it in Bridge, and choosing Open in Camera Raw.*

Q&A

Mega Worries

Q While I continue to be happy with my 6MP Pentax *ist Ds, I am looking to purchase another camera to get image stabilization and auto sensor cleaning. My major concerns with the new cameras are the large files they produce, and the effect this will have timewise on my computer. I have narrowed down my choices to the Pentax K200D (10.2MP) and the Pentax K-x (12.4MP). I am also looking at the Pentax K20D, the K-7, and the K-5, but these three have very high megapixel counts. Any thoughts? **Chet Jankowski via e-mail**

A *It's a rare day here when we hear from someone who wants less, not more, pixel resolution. Note that your first four choices are discontinued models; while they may be available at some retailers, we'd go instead with the current Pentax K-5 or the new K-30 for improve-ments in autofocus speed and imaging quality. Both of these cameras offer speedy shooting in a rugged, weatherproof body. With either camera, you can step down the captured JPEG resolution: The 16MP K-5 can be set to 10-, 6-, or 2MP capture, and the 16MP K-30 can be dialed down to 12-, 8-, or 5MP. You can also combine RAW capture with any JPEG resolution.*

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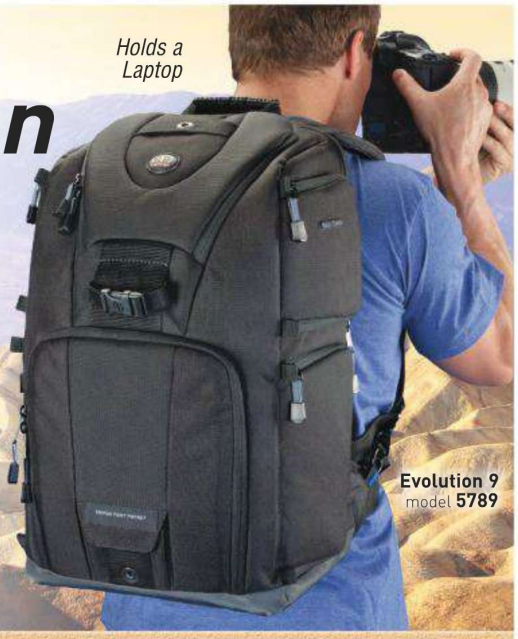

Evolution 9 model 5789

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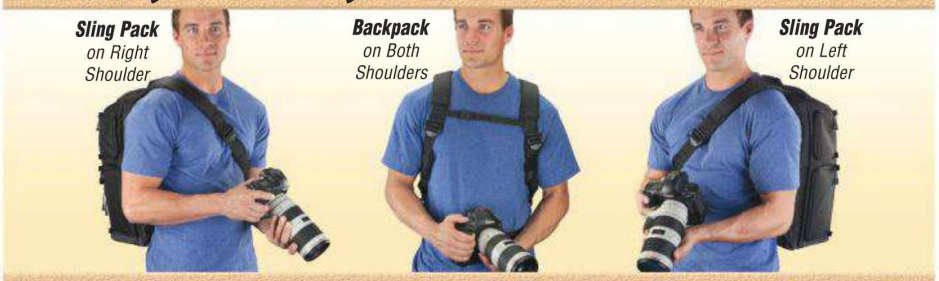

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Shades of Gray

This month's winners look marvelous in monochrome

MONTHLY PHOTO CONTEST

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3rd Place $100 Prize

RAFAL MALESZYK, 34, PHOTOGRAPHER, OAHU, HI The big challenge when working with a dramatic sky is the different intensity of light on the foreground and the sky. Finding the right point of view is also critical. Landscapes are hard, since changing point of view can sometimes mean walking a mile (or ten). I had to find a vantage point that moved the sunflowers to the bottom of the frame, uncovering the dynamic backdrop. **TECH INFO: Tripod-mounted Hasselblad H3D with 80mm f/2.8 Hasselblad HC lens; exposure, 1/125 sec at f/13, ISO 100. Contrast and black-and-white conversion in Adobe Photoshop CS4.**

2nd Place $200 Prize

KIMBERLY CRAVEN, 29, STUDIO MANAGER/PHOTOGRAPHER, BROOKLYN, NY At museums, zoos, and aquariums, I'm almost more fascinated by the people visiting than by the attractions themselves. There's a strange relationship between the subjects on either side of the glass. This girl's father was setting her down in front of a critically endangered western lowland gorilla at the Bronx Zoo, right up against the glass. I only had to wait out the horde of visitors wanting to get as close as possible. **TECH INFO: Canon EOS 20D with 24–70mm f/2.8L Canon EF lens; 1/800 sec at f/2.8, ISO 800. Exposure, contrast, and b&w conversion in Adobe Photoshop Lightroom 3. Minor edits in Photoshop CS5.**

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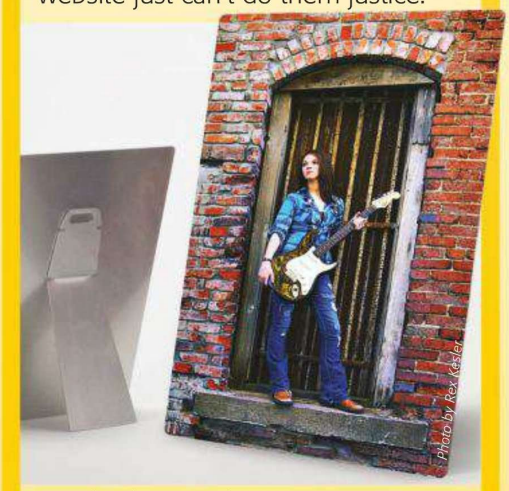

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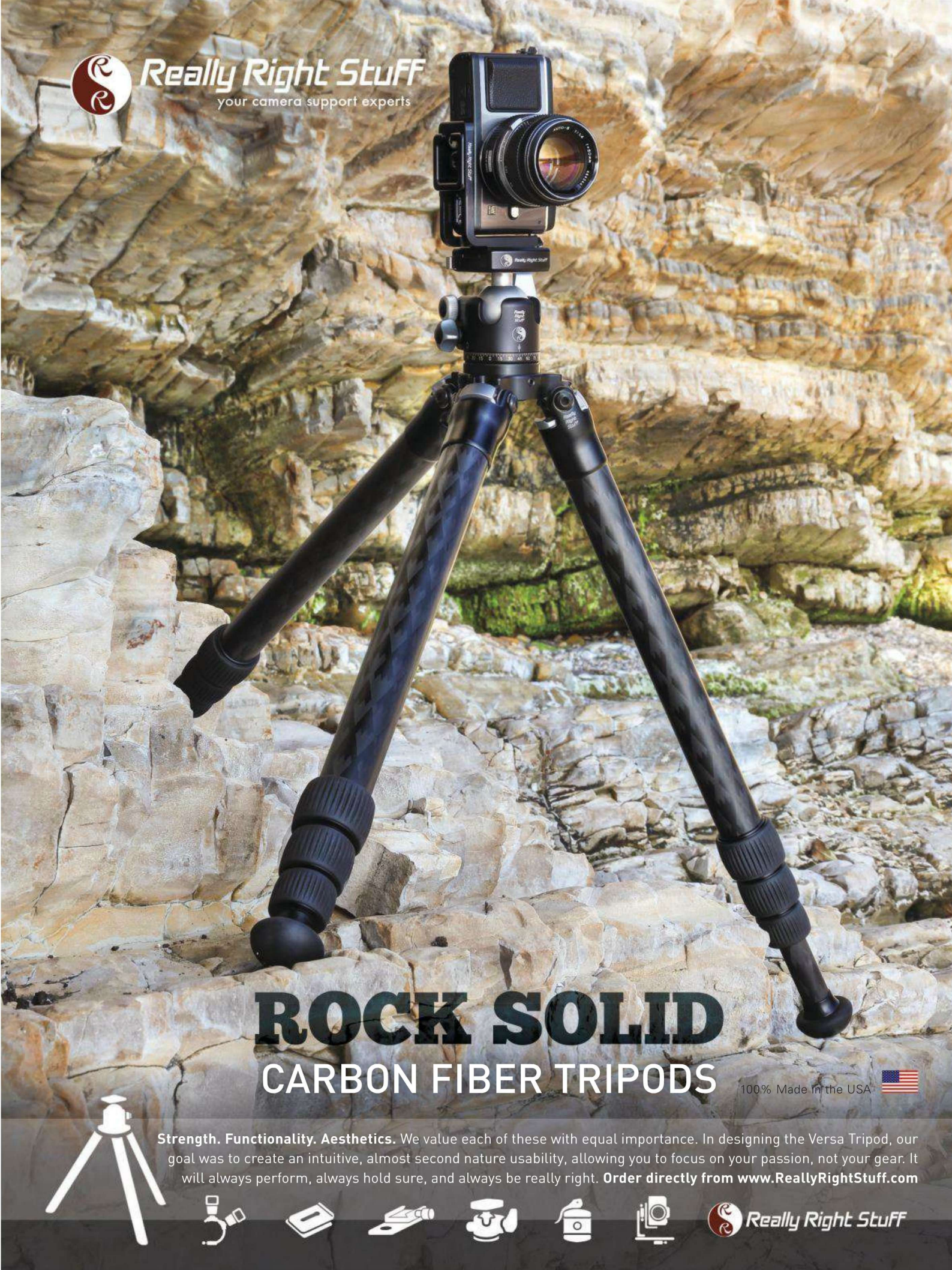
GRETCHEN McMULLEN, 34, HOMEMAKER, ROCHESTER, NY

At the National Aviary in Pittsburgh, shooting by a large window with an abundance of natural light, I remembered the "Wildlife in Black and White" article (September 2011) and thought this would be the perfect opportunity to showcase this bird's detail and dominance. The bird, a blue crowned pigeon, was in constant motion—it would only stop for a few seconds at a time before wandering to a new location. Waiting for the perfect shot while keeping a handle on my three little ones was a challenge.

TECH INFO: Canon EOS Rebel T2i with 85mm f/1.8 EF Canon lens; 1/640 sec at f/1.8, ISO 200. Levels, hue, and saturation adjusted in Photoshop Elements 9.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HOW

EXPERT TIPS AND TECHNIQUES FOR BETTER PHOTOS

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CREATIVE THINKING

POOL PARTY

BARBARA COLE, TORONTO, CANADA

A dip into aquatic abstractions

WHEN YOU want to dive deep into a subject, there's nothing like immersion. And fine-art photographer Barbara Cole does just that—she finds inspiration deep in her pool. Based in Toronto, Canada, Cole has long been attracted to the reflections and patterns she sees while swimming. "The water puts me into a meditative state that allows me to think very creatively," she says. So she wondered how she could "have fun" with a color palette you don't normally see in water.

"Magic Carpet" is one of many underwater color studies on www.barbaracole.com.

This photo, "Magic Carpet," comes from her *Chromatics* series, an exploration of human figures combined with the spirit of the color field painting movement.

"The water gives me a softer demarcation between colors, the way Mark Rothko blended the edges of color together," she says. In this photo, "When the water moved, it would distort the edges of the purple on the red, and I thought of the flower-like shapes in Helen Frankenthaler's work."

The concept sounds simple, but her productions are anything but. Aside from the risk of working in and around water with electricity (for her lights), she must contend with bad weather and more.

At least her models—often dancers—love the work. "I tell them to imagine that they're brushes dipped in paint," she says. "They 'paint' a blur of color across other colors."

Shooting from above, Cole uses a slow shutter speed with a touch of flash. The water's surface texture is captured along with the model's body movements. The texture is further enhanced by the light of the sky and reflected clouds.

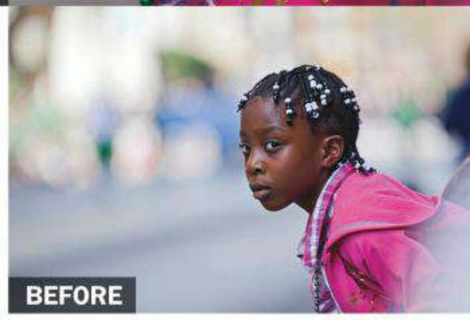
Cole is a strong believer in doing as much as possible in the camera, thanks to years of experimenting with Polaroid instant films and cameras. Now that she uses Canon digital cameras, she finishes her images in postprocessing by "painting" in subtle enhancements to give the viewer something to recognize. Though she won't divulge her technique, she "picks out certain things that your eye will be able to focus on so you perceive the image with a certain sharpness."

After all her effort, viewers are sometimes conflicted by her extremely abstract work. "One guy said photography 'shouldn't do this,'" she says. "He felt it was too painterly. I always try to make people stop, wonder, and really enjoy it." *—Laurence Chen*

FIX IT FAST

Face Time

Juggling backlit tones



SHAN JIANG

An aperture of f/3.2, a long lens (70–200mm f/2.8L Canon EF IS II), and a full-frame DSLR (Canon EOS 5D Mark II) threw the background out of focus at Atlanta's St. Patrick's Day parade. Exposure: 1/1250 sec at ISO 320.

SHAN JIANG'S shot of this little girl makes good use of negative space and shallow depth of field. But we wanted to bring out more detail in the girl's face without blowing out the background.

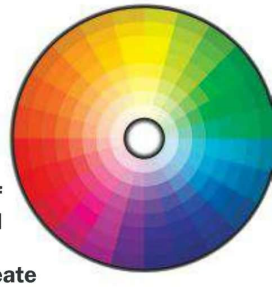
Working with Jiang's RAW file in Adobe Camera Raw, we raised the overall exposure, then brought up the shadows and pulled down the highlights using the Basic sliders. We added Clarity and Vibrance for midtone contrast and saturation, and warmed up the color balance.

Then, in Photoshop CS6, we cropped the image to a 4:3 aspect ratio, getting rid of most of the out-of-focus blur in the lower right corner. We masked off the remaining blur, used Curves to increase the contrast, and boosted the saturation to disguise the blur as part of the sweatshirt. Total time fixing: 20 minutes.

—Dan Richards and Debbie Grossman

PHOTO GLOSSARY

COLOR WHEEL



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FIRST DEVISED by Sir Isaac Newton, the color wheel is a visual tool that shows how colors relate. The simplest offers just the three primary colors of red, yellow, and blue. More complex wheels, like the one here, show secondary and tertiary colors, which are mixtures of equal parts of primary and secondary hues. Color wheels are often used in a shorthand manner to talk about color and its effects, as we do in this month's Lighting column. The wheels can, for example, also help set builders create a visually calming color scheme by selecting colors that are contiguous (or nearly so) on the wheel (called analogous colors), or, conversely, an energized color scheme if they select colors from opposing positions along the wheel (complementary colors).

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QUICK TIP

Window Light

Open more portrait possibilities

AS FAR back as the Renaissance, portraitists have made endless use of windows: to bathe a subject in the flatteringly soft light that falls through a north-facing casement, or frame a portrait within the picture's frame.

On a psychological level, a window allows you to contrast what's happening inside and outside. Such contrasts can draw you into the inner life of your subject by pointing out disparities or similarities between the two worlds.

That's just what Eric Rolph did with this portrait of a friend looking out at the Boston waterfront. "I was moving to another part of the country, and we were about to part for several months," he says. "We both looked out at the city that had provided us with many shared experiences, and were feeling a bittersweet nostalgia."

By contrasting the city's energy outside and his friend's pensiveness within, Rolph's picture powerfully underscores the duality. *—Peter Kolonia*

Rolph made the picture with a Canon EOS 5D and 17–40mm f/4L Canon EF lens. For more of his work, visit rolphphoto.com.

ERIC ROLPH

30-SECOND SOFTWARE

ONE OF OUR favorite additions to Lightroom 4 is the ability to soft-proof—to preview the transformation your image will undergo on output. To activate it, while in the Develop module, check the box labeled Soft Proofing. An options panel will appear: Choose the profile under which you'd like to preview your image. The color spaces sRGB and Adobe RGB are listed, but you can click Other to add paper profiles for your printer. Then click the icon in the upper-right corner of the histogram to see a gamut warning. Illustrated here, it will show you a visual representation of any colors that your printer/paper combination or color space can't reproduce. You can then make the requisite color and other corrections to ensure your output photo looks the way you want. Finally, click the button for Create Proof Copy to save this version. *—Debbie Grossman*

DEBBIE GROSSMAN

What's This?

Holga iPhone Lens Filter Kit

▶ **What it is:** A $30 accessory that clips around the iPhone 4 or 4S. A spin of its turret places any of nine different special effects filters in front of the camera lens. Available in six colors, the case also mimics a classic rotary phone for extra hipster-ironic street cred.

▶ **Why use it:** To make plastic film-camera effects on the fly—without an app.

▶ **What's possible:** In addition to color, macro, and multiple image filters, one of the ports is empty, allowing you to shoot straight images without having to remove the case.

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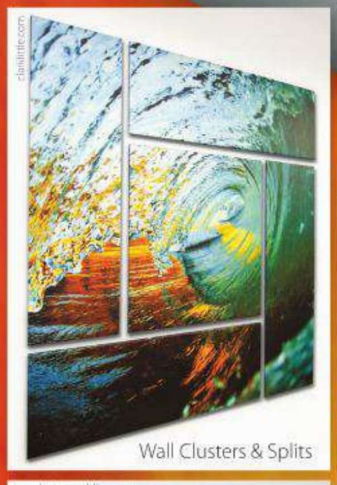

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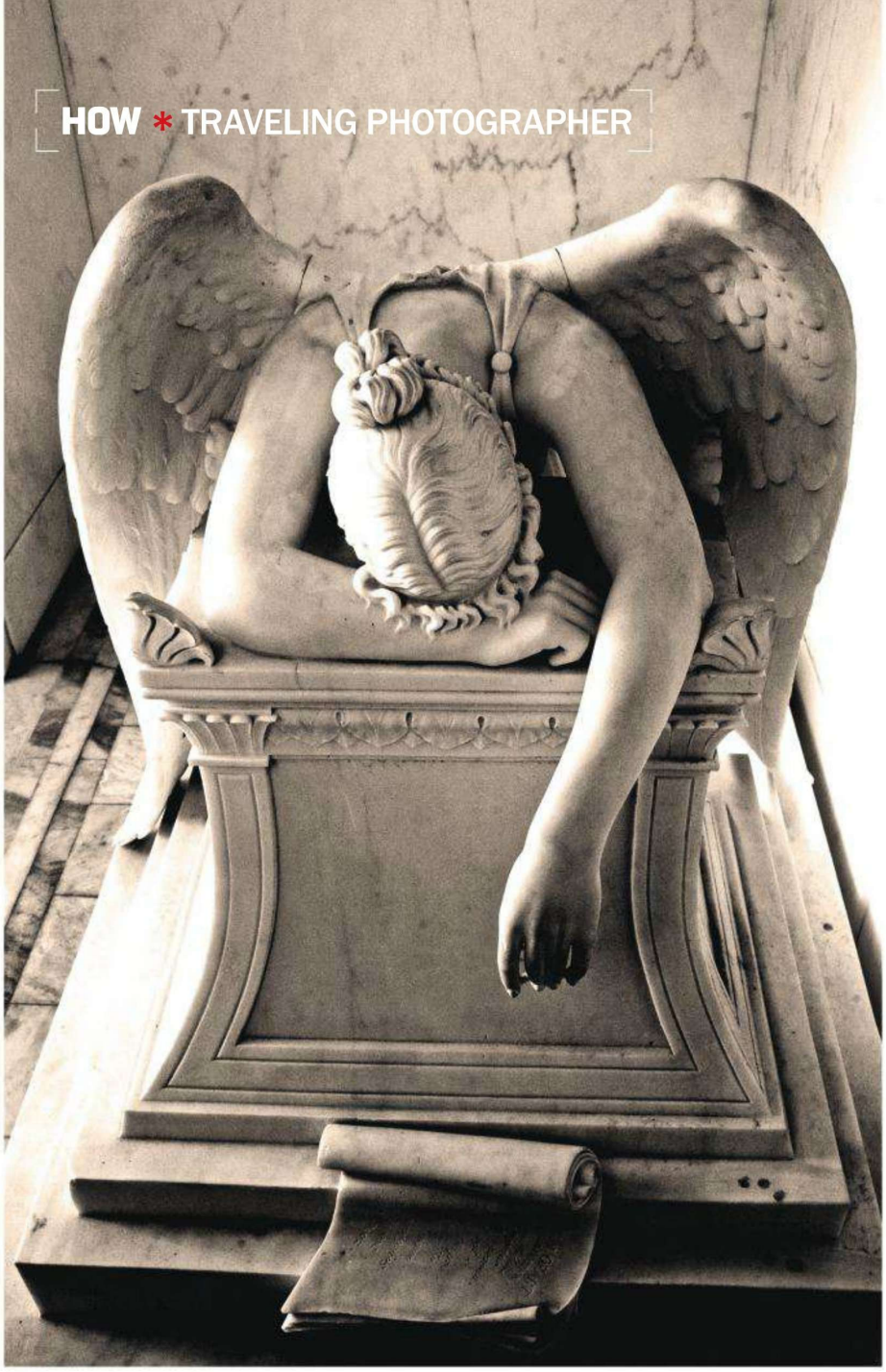

LAURA MCELROY

PLOT SHOTS

Cemeteries, where heavenly photos await

WHILE MOST of us think of cemeteries as pretty lawns used as long-term parking for the dearly departed, they also present a rich mix of interesting photo subjects. Mount Auburn Cemetery in Cambridge, MA, for example, describes itself as "a botanical garden, an outdoor museum of art and architecture, and an important habitat for urban wildlife."

And though spending a day wandering among graves might sound like an Addams Family outing, Atlanta-based photographer Laura McElroy finds shooting in cemeteries to be a "very calm, creative, and serene experience."

McElroy, who has shot extensively in the historic cemeteries of New Orleans, looks for scenes that yank at heartstrings. "I try to evoke an emotion—whether it's mystery, sadness, curiosity or hope," she says. Among her treasured finds: a statue of a dog pining for his master and a doll left at a child's grave. Angels (like the one shown here) are another favorite.

McElroy prefers to work with the warm light at the edges of the day—though she often takes the drama a step further by incorporating sunset skies: "I look for things such as a series of crosses atop tombs or a statue of an angel silhouetted at sunset," she says.

For spookier shots, she suggests visiting New Orleans during "La Toussaint" (All Saints' Day, November 1), when family members practice the tradition of whitewashing tombs and, at nightfall, lighting candles on them.

If lying on graves doesn't creep you out, McElroy also suggests finding unusual vantage points: "One lesson that I've learned is to keep working until you have taken six distinctly different shots of your subject."

—Jeff Wignall

WHERE TO GO

GRAVE MATTERS

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- **FOREST LAWN MEMORIAL PARK,** Glendale, CA. Final curtain call for a large cast of Hollywood stars, including George Burns and Walt Disney. (forestlawn.com)
- **GRACELAND CEMETERY,** Chicago, IL. Says its website: "An oasis of art, architecture, and horticulture since 1860." Only still photography is permitted; no tripods. (gracelandcemetery.org)
- **GREEN-WOOD CEMETERY,** Brooklyn, NY. Encouraging photography, Green-wood even has a Flickr group. (green-wood.com)
- **MT. AUBURN CEMETERY,** Cambridge, MA. Lovely in autumn, it prides itself on abundant birdlife, flower plantings, and handsome tombs. (www.mountauburn.org)
- **ST. LOUIS CEMETERY NO. 1,** New Orleans, LA. The city's oldest is a small village of above-ground tombs—one holds a voodoo queen. (cml.upenn.edu/nola)

Hoodman builds RAW STEEL ruggedness and "Pin Guard$_{tm}$" into a new SuperSpeed USB 3.0 UDMA Card Reader

Enjoy time saving 5 Gbps data transfers of CompactFlash or SD cards with a new ruggedized RAW STEEL SuperSpeed USB 3.0 UDMA card reader from Hoodman. Downloads are up to 10 times faster than USB 2.0 specs.

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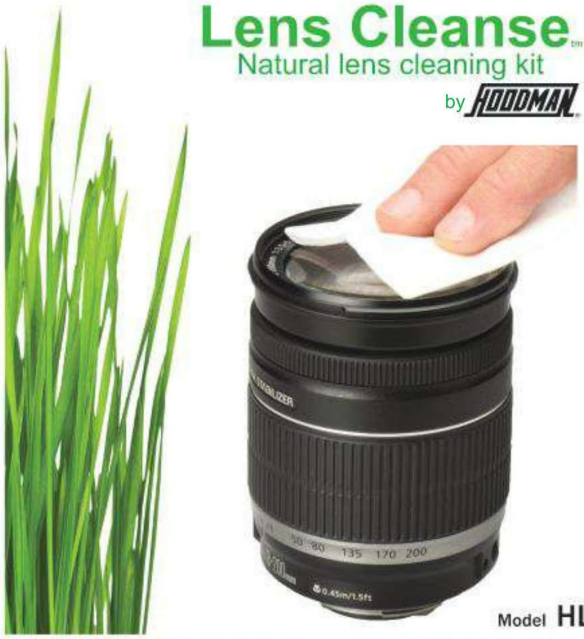

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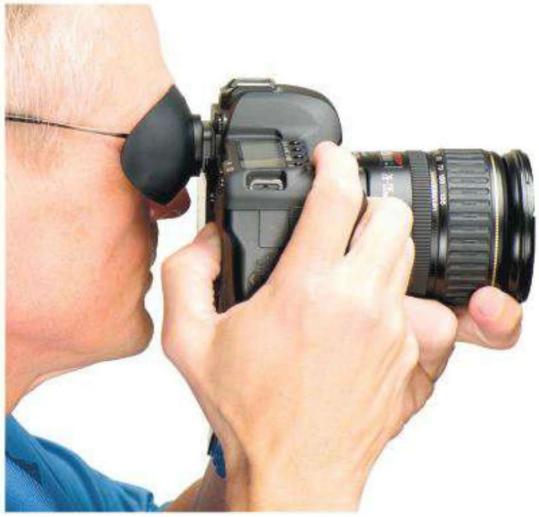

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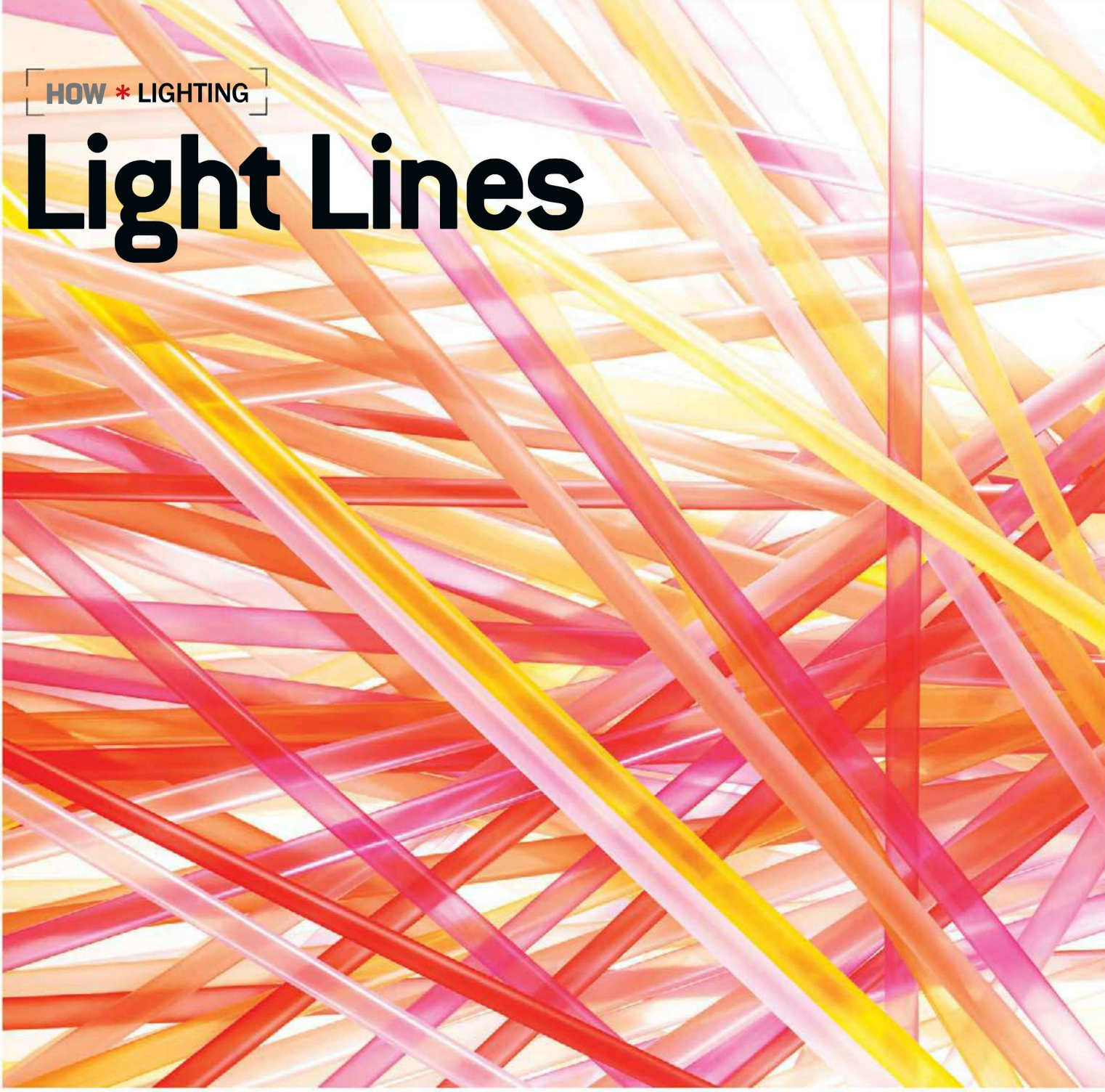


JOSHUA SCOTT

Enhance abstractions with the right illumination

A STILL-LIFE specialist, Joshua Scott (www.joshuascottphoto.com) created this eye-popping abstraction as a portfolio piece to showcase his studio's lighting, propping, and prepping skills. "It was for my book that goes out to art buyers and photo editors, and I wanted to wow them with some bright energy," says this New York-based pro.

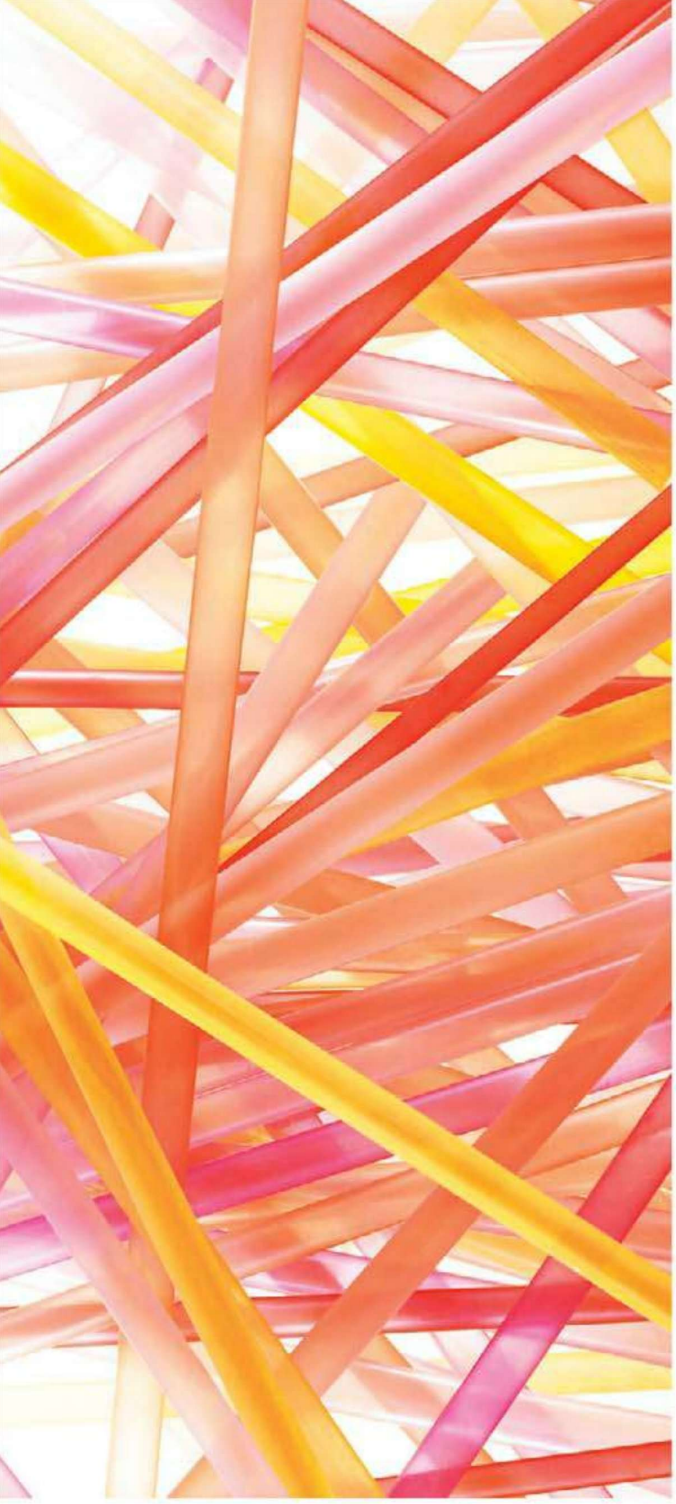
It's got that and a whole lot more: line, form, dimension, and color. All brought to vibrant life thanks to great lighting.

His secret? "I let the product dictate how it is lit," he says. "In this case, what attracted me to the straws was their translucent quality, color, and length. Side-to-side backlighting by a lightbox would best serve all these properties, so that's what I used."

For busy abstractions like this, Joshua Scott says, "Don't overarrange the objects. Often, it's better to just throw them down rather than meticulously arrange them."

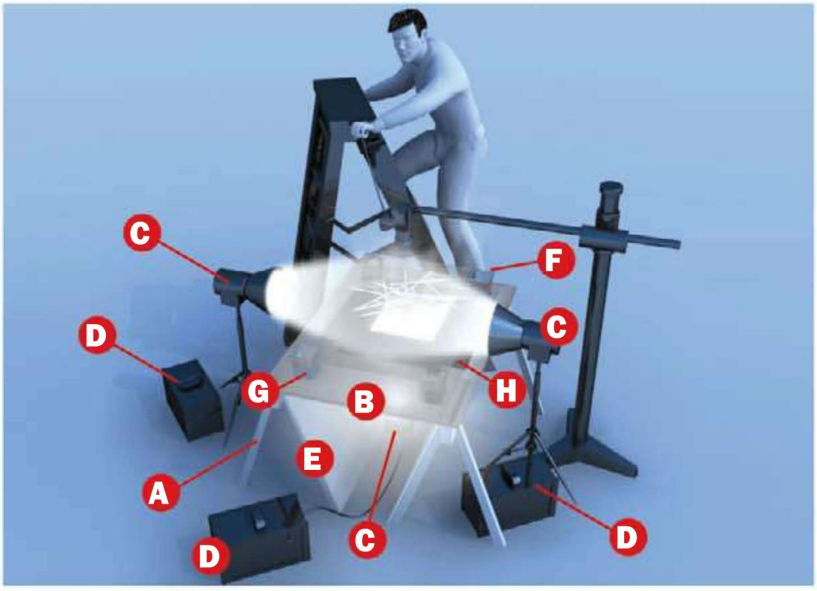
Scott started by picking subjects of compatible hue, using uniformly warm tones. He could have created an equally lively effect by using cool-toned or even complementary hues from across the color wheel (magenta with green, or blue with yellow).

What makes his colors pop, however, is Scott's careful backlighting, set to produce



BACKLIGHTING BASICS

SIMPLE ▬▬▬▬▬▬▬▬▬▬ COMPLEX



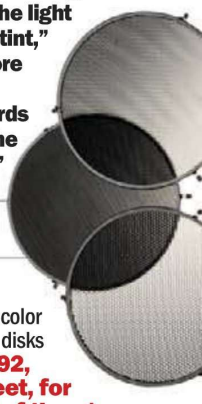
KRIS HOLLAND/MAFIC STUDIOS (ILLUSTRATION)

To build the light table that would backlight his straws, Joshua Scott started with sawhorses (A) and a milky white sheet of acrylic (B). To create the backlight, he placed a Broncolor Primo (now, Unilite) strobe head (C) under the table, which he powered with a Broncolor Graphite A4 (now, Scoro A2S 1600) power pack (D). Sidelighting came from additional Primo/Graphite pairings (with grids), while the bottom light was intensified with two white reflectors (E). Scott arranged the straws on a pane of thin window glass (F) that he held above the light table with four glass blocks (G). "A thicker pane can have a green tint," Scott explains. "And I elevated the straws, because it gave me more control of light quality than would have been possible if they had been in contact with the light source." Six-inch black foamcore cards surrounding the light table (H) gave him extra contrast control. "The closer the cards were toward the center, the contrastier the light."

THE GEAR

Bron-color Scoro A2S power pack **($9,170, street)**

Broncolor Unilite strobe head **($1,506, street)**



Broncolor Grid disks **($292, street, for set of three)**

just the right ratio of front to back light. He arrived at this ratio by incrementally adjusting the power levels of the top and bottom strobes until the colors looked deeply saturated while the straws remained translucent.

"Understanding light ratios and how they impact the final image is crucial to building up various light sources into one overall exposure," he says. "One of the most valuable tools was my lightmeter. It showed exactly how much top and bottom light was stiking the subject."

Scott shot with a Sinar X body, 90mm Sinar lens, and Phase One P30 digital back. He supported the camera with a Foba light stand and fired the shutter with a cable release.

Defining the shape of the straws took just as much trial-and-error effort. Scott started by highlighting the straws with sidelights: two Broncolor strobes on opposite edges of the set. This produced noticeable flare, which he throttled back first by adding focusing grids to each sidelight, then by surrounding the light table with 6-inch black cards to swallow some light and bump up overall contrast. Doing so emphasized the shape of each straw by adding weight and presence along their tops, in contrast to the brighter edges.

The hardest task in Scott's project? Picking through hundreds of straws to find only the cleanest, most perfect, and least crimped or creased specimens. *—Peter Kolonia*

ANDREW WOOD (ORIGINAL)

In the Zone

Use Lightroom 4's selective adjustments for total tonal control

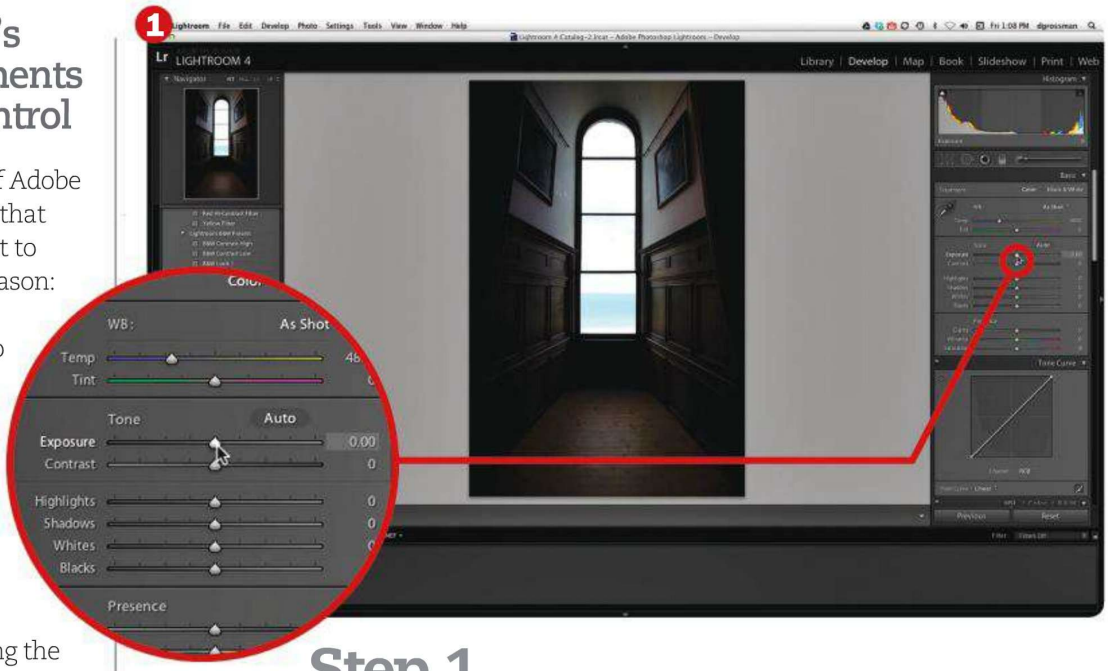
IN LAST MONTH'S review of Adobe Photoshop CS6, we stated that it is becoming less relevant to photographers. One big reason: Photoshop Lightroom 4's greatly enhanced ability to transform images on its own, through a much cleanier and easier-to-navigate interface than you get in Adobe Camera Raw, which offers the same tools.

Lightroom allows selective adjustments using the Adjustment Brush tool, and, with version 4, even white balance can be brushed on. This means you can easily correct mixed lighting to make it match, or paint on different zones of white balance for creative effect.

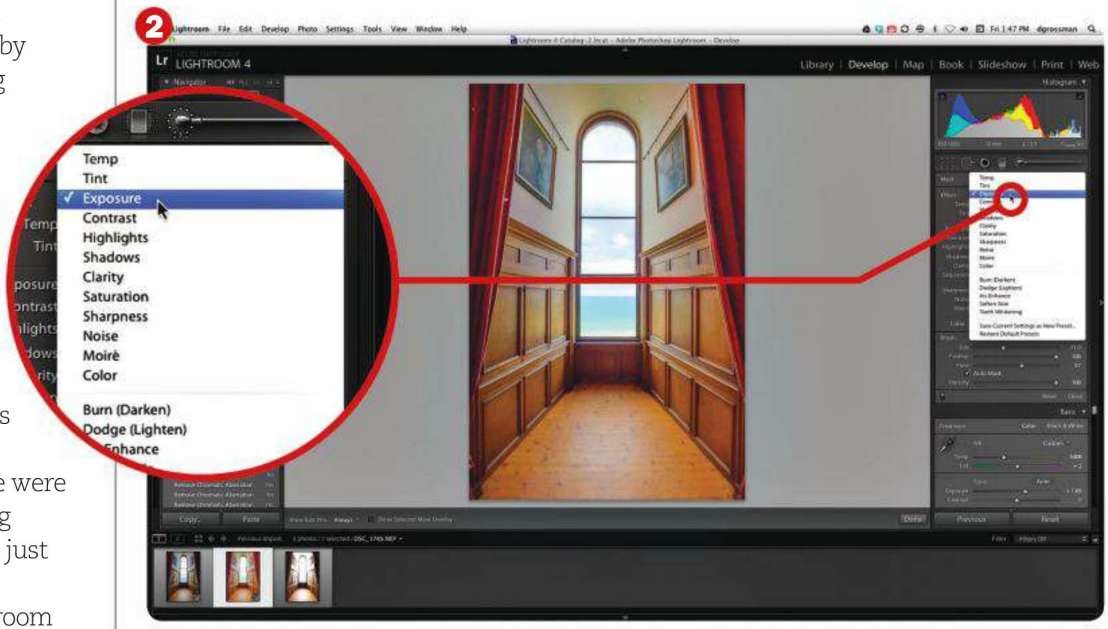
This photograph, taken by Andrew Wood in Bamburg Castle, Northumberland, England, nicely illustrates the power of both selective adjustments and Adobe's new Camera Raw processing engine. Wood originally produced his final version of this picture by combining three exposures to make a high-dynamic-range (HDR) image, but we were able to take it this far using selective adjustments and just one of his exposures.

Here's how to use Lightroom 4 to work multiple zones of your image and create a final RAW conversion that really sings. No Photoshop—or layers—required.

—Debbie Grossman



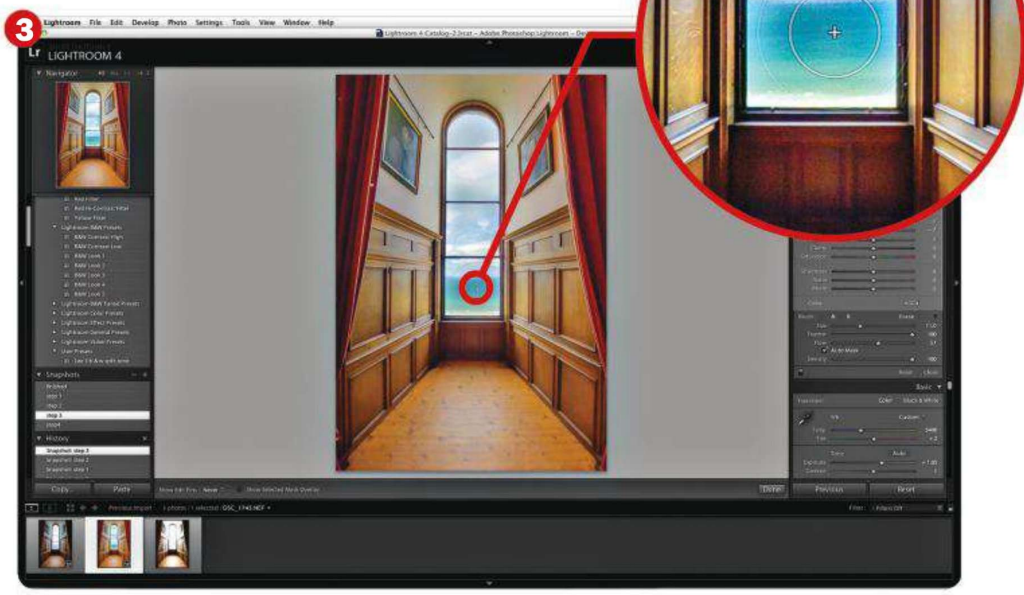
Step 1 Before you go local with your adjustments, start global and do a basic conversion. **Adjust white balance and exposure, and decide whether or not to use a built-in lens profile.** This exposure is very dark, but it has the best highlight detail of the three the photographer shot for the original HDR image. Bring back as much shadow detail as possible, then use the color and luminance noise reduction tools to make the image usable.



Step 2 **Click on the Adjustment Brush icon to get started. Then use the Effect pulldown menu to choose the adjustment you want to apply.** More detail is needed in the window's view, so choose Exposure. Then set up your brush: Check the box for Auto Mask to allow Lightroom to help you keep within your edges.

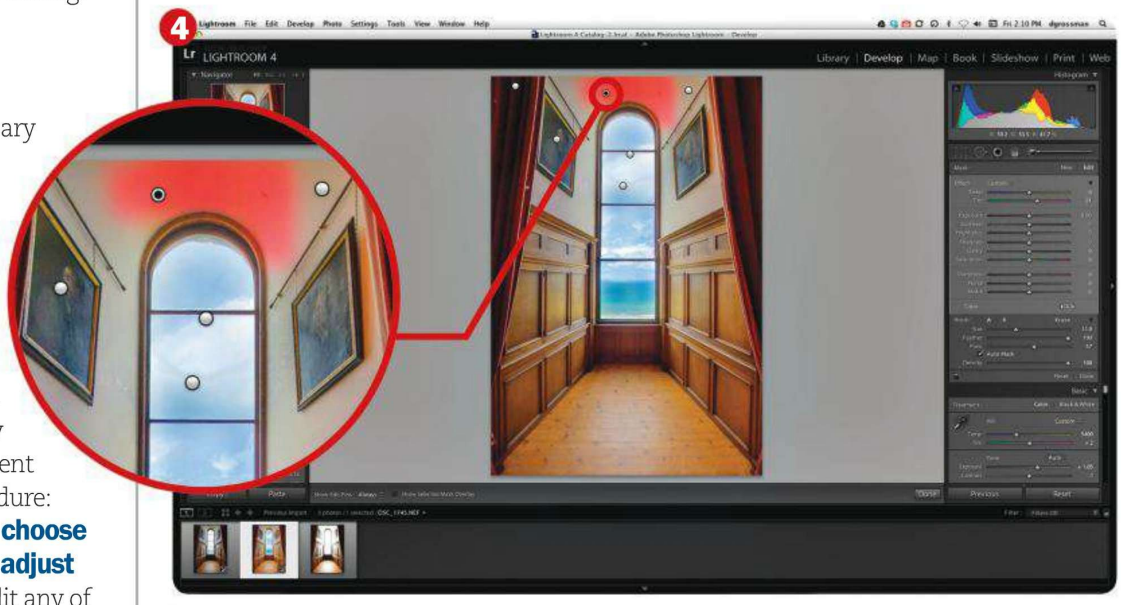
Step 3

Mouse over your image and use the left and right bracket keys to make your brush larger or smaller according to the area you're working on, then paint in your effect. Moving the sliders before you paint on an adjustment can be a bit of a guessing game. So go with the default, then, after painting, readjust the Exposure slider to further decrease the exposure in the window's view. If the location of the adjustment you painted isn't right, erase some of it by clicking on Erase in the Brush menu and paint out the adjustment where it doesn't belong.



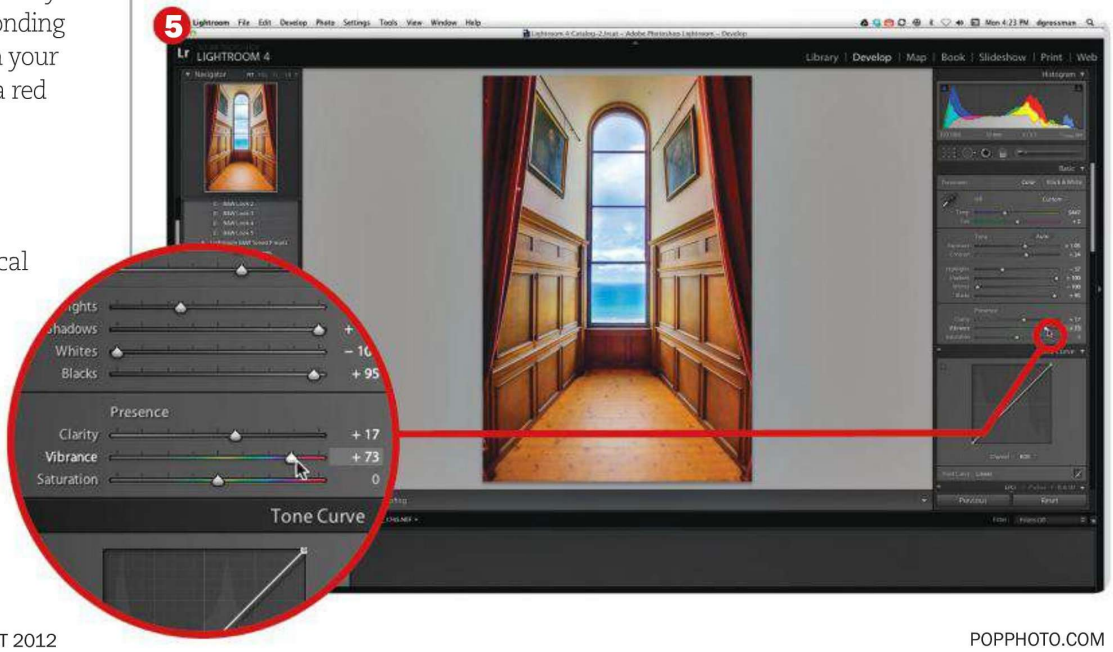
Step 4

More adjustments are necessary in this image: The curtains are too bright, the paintings on the wall could use some dimming, and there are some color shifts on the ceiling that can be fixed with selective white balance adjustment. To start repairing them, click the New button to add a new adjustment point. Follow the same procedure: **Use the pulldown menu to choose your effect, paint it in, and adjust the slider.** To go back and edit any of the areas, click on its corresponding gray dot. Note that clicking on your adjustment point shows you a red preview of its location.



Final Step

Once you've added all the local adjustments you want, you may find that the final product needs further global tweaking. In this case, all the evening out of exposure has left the image a little flat. **Edge up the Clarity and Vibrance sliders to make it pop.**



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Pet Project

Give an animal the studio treatment

DARREL A. HARRIS

AS A PRO photographer, Darrell A. Harris wears many caps. And faces different challenges in each. A full-time coroner investigator for the Marin County Sheriff's office, this resident of San Anselmo, CA, has no trouble getting his typical workaday photo subjects to hold a pose. But on weekends, he takes on more lively subjects, often making strobe-lit people and pet portraits in their homes—or in this case, his own dining room.

Surprisingly, his two careers are somewhat symbiotic. "My training in investigating deaths included courses in forensic photography," explains the 41-year-old photographer. " And over the years, I've taken the principles of lighting crime and death scenes and learned to apply them to portrait and pet photography."

Harold, Harris's miniature wirehaired dachshund, is one of many beneficiaries (see more of his photographs at www.dalanharris.com).

Harris offers tips for canine portraiture, from lighting to working with subjects who don't always take direction.

- **Don't stress the pet.** The smaller and less intrusive your studio setup, the better. "I have both standard studio gear and a portable, run-and-gun kit made

up of the compact Elinchrom Quadra strobe, Canon Speedlites, small booms, and wireless triggers," says Harris. "I've found that, when shooting dogs, compact works best both indoors and out. It's less intimidating for the dog, and it's easier for me to work a smaller light around the pet than the pet around the light."

- **Use the right gear.** Quick-recycling studio lights mean more shots per minute. This is important because "dogs have other things they'd rather be doing," he laughs. Also, when the pet strikes a classic pose, you want to get off as many shots as possible.

Lens selection also counts. "With a dog that I'm familiar with, I will sometimes use a wider lens, like a 50mm, so that I can get closer and nudge the little guy back into the frame. But for dogs that I don't know, I move back and give them space by switching to my 70–200mm f/2.8 telephoto."

He avoids maximum aperture, though. "When I got my first f/2.8, I turned into Bokeh Joe," says Harris. "Don't do it! My rule of thumb for sharp eyes is: the longer the snout, the smaller the aperture."

- **When indoors, crank up your modeling lights.** This will constrict your subject's pupils, subsequently adding more of the beautifully colored iris to your shot.
- **Get low.** Just as with children, shoot from a low camera angle. Not only does this let you shoot straight into Fido's eyes, where you will most likely find a bit of the dog's personality, but "giving viewers a ground-level view of something they normally look down on automatically adds interest," says Harris.
- **Wait for the right age.** Puppies are too active; wait a bit. "After Harold hit a year, he began to calm down. I took advantage of it, and finally got a solid portrait of him," says Harris.

—Peter Kolonia

For his portrait of dachshund Harold, Harris lit with an Elinchrom Quadra (A), its head in an Elinchrom beauty dish (B). A backlight (C) separated the dog from the background, while black panels controlled side fill (D). A white fill card in the foreground (E) opened up shadows on the chest.

Harris shot with a Canon EOS 5D Mk II and EF 70–200mm f/2.8L IS. He backlit the dachshund with a Canon 580 EXII Speedlite and Saxon PC grid spot (shown). Both were supported by an Avenger Baby Stand.

Step 1

Figure out the look you want. "If you're inspired before you start," says Harris, "you will find the energy and focus to work until you've got it right." He finds inspiration in book covers, movie posters—any great portrait.

Step 2

Set up with a stand-in. Harris doesn't bring the pet into the studio until he's got his lighting, focus, and exposure perfect. He practices on a stack of books that's about the same height and depth as the dog. He often puts the camera on a tripod, adjusting its height so the lens will be at the subject's eye level.

Step 3

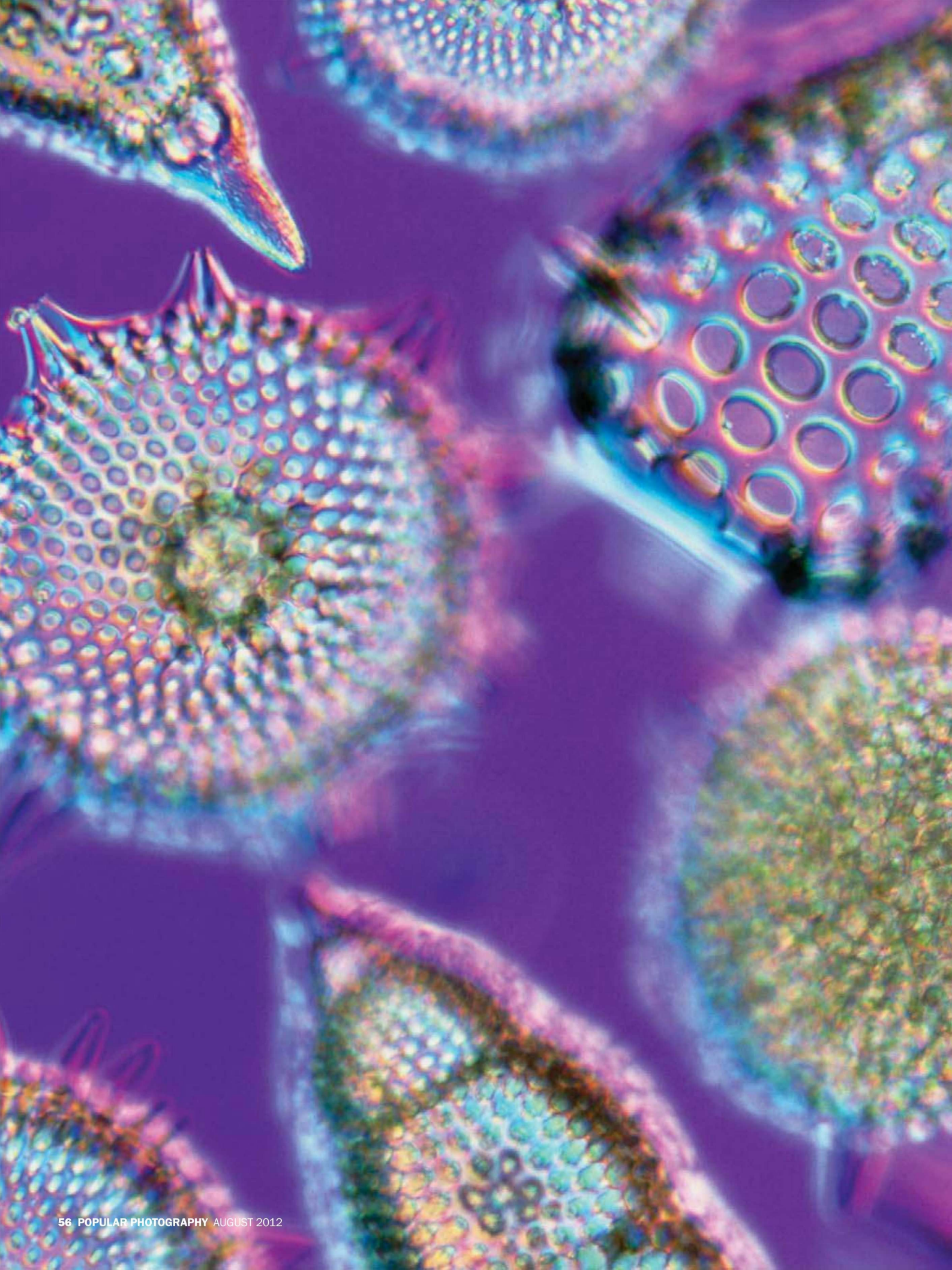
Calm the pet. "I begin the session by petting, and talking to the dog, while feeding it treats," say Harris. Often, if the dog knows that you have treats, it won't overreact when the flash starts firing.

Step 4

Keep the pet engaged. When the shooting starts, you can hold a dog's attention by talking to it and making noises with squeaky toys, a clicker, or even crumpling paper. Alternate sounds, but don't overdo it. "If you put the little guy in sensory overload, he'll shut down," warns Harris.

Final Step

Clean up in software. "Afterwards, expect to have to adjust color temperture, even out contrast, and pop colors in the coat," says Harris. "Now print, frame, and hang it!"



MICRO PHOTO GEMS

Photos by Alfred Pasieka
Text by Dan Richards

Beyond closeups, beyond macro photography, lies the world of photography through a microscope—a tiny realm in which ordinary objects turn into weirdly beautiful, abstract, and very often intensely colorful images. Alfred Pasieka, a top practitioner of this scientific art, shows us how it's done.

RADIOLARIA These marine protozoa form hard silica skeletons around themselves. Their fossilized skeletons on the sea bed formed minerals such as flint. Shot with a Leica microscope on Zeiss macro stand with Hasselblad 6x6cm rollfilm back; 400X magnification on Fujichrome 50 Tungsten.

ALFRED PASIEKA attributes his career in microscopy to a portly gentleman in a red suit.

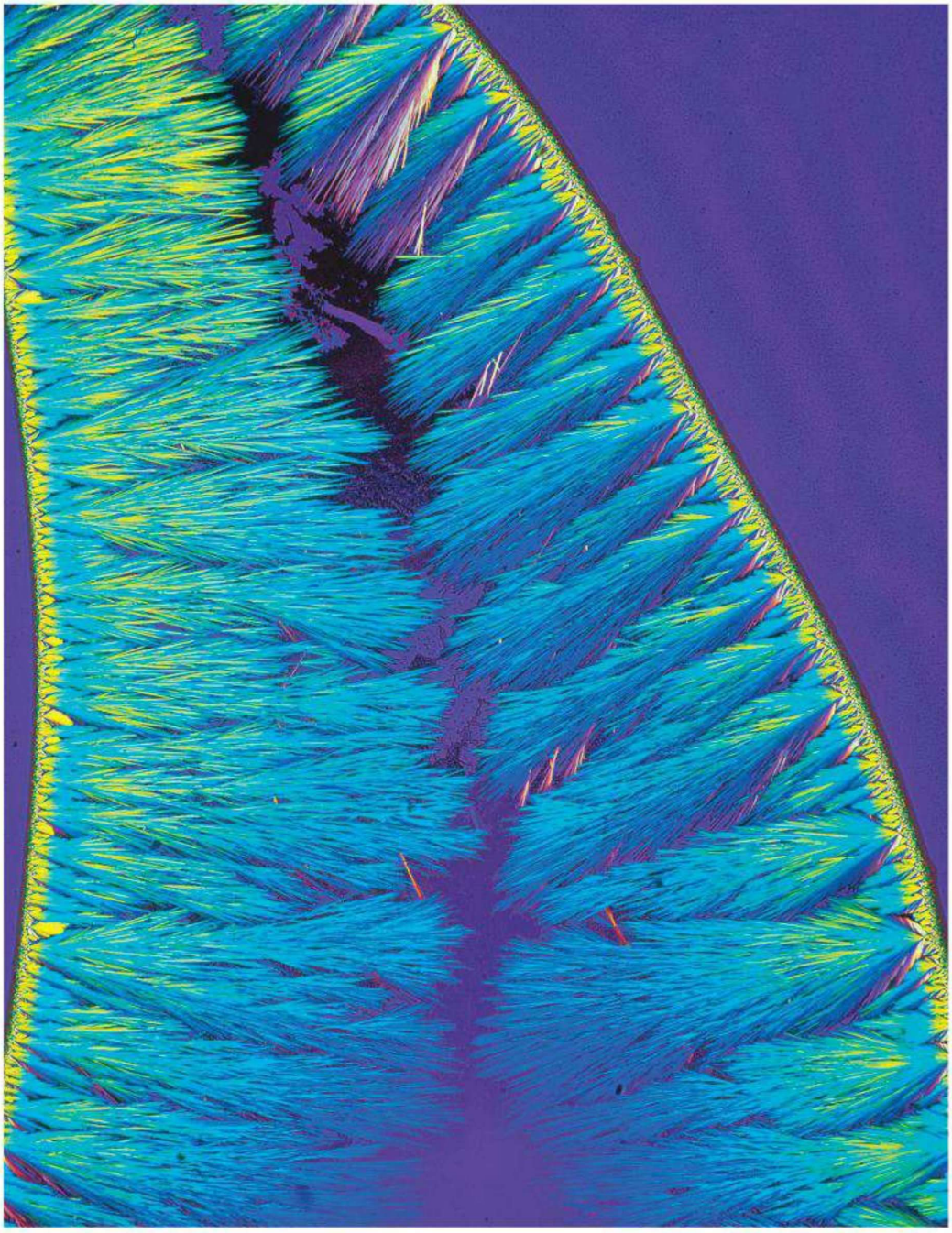
"When I was 12, Santa Claus surprised me with a basic kid's microscope set with some prepared specimens, and I was immediately captured by what I saw," he recalls. "Soon I found out about the wonderful world of crystals, derived from chemicals like vitamins, sulfur, and so on, and that became my main interest—turning these microcosms into pieces of art."

And since Pasieka was already a shutterbug, he seemed almost destined to become one of the world's premier makers of photomicrographs—photos made through a microscope. He pursued micrography and scientific study as a hobby, graduating to more and more sophisticated equipment along the way. "After I had done some nice shots of crystals in polarized light, I contacted the supplier of the original chemicals with sample images," he says. "They liked them and bought them for use in advertising, and so the whole thing started."

Today his clients include industrial firms, ad agencies, publishers, research institutes, and photo agencies such as Getty Images and Photo Researchers. His subjects range over biology, crystallography, technology, and zoology.

Based in his native Germany, Pasieka's equipment has come a long way from his Agfa Clack camera and kid's microscope: Leica, Nikon, and Zeiss micro-optics and dedicated digital microscope cameras. He uses a variety of software applications to make image stacks with extended depth of field and three-dimensional effects.

"But what's a microscope without a specimen?" Pasieka asks. And so he's assembled an "ever-growing" stock of chemical substances and prepared microscope slides as subjects.



ADENINE A member of the purine family of nucleic acid bases, adenine is found in the structure of DNA and RNA. Leica/Zeiss microscope combination used to make 40X image on 4x5 Fujichrome 50 Tungsten.

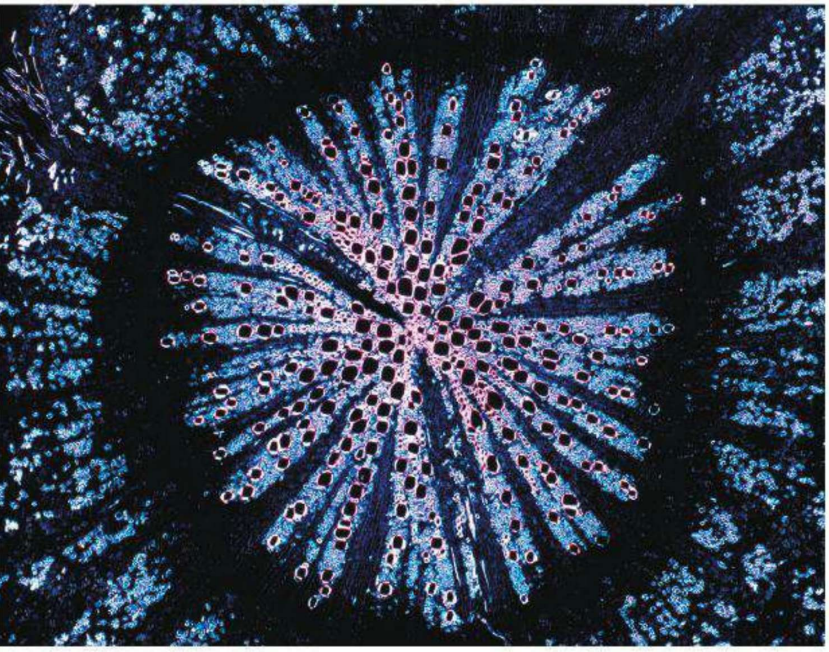
Scope Breakthroughs

Pasieka cites several dramatic advances in compound optical microscopes, notably infinity optics. These are objective lenses that are focused to infinity—that is, with light rays traveling in parallel—rather than to the fixed finite distance of the scope's tube length. This allows the introduction of components such as polarizers, fluorescence illuminators, and differential interference contrast (DIC) prisms into the optical path with minimal loss of image quality.

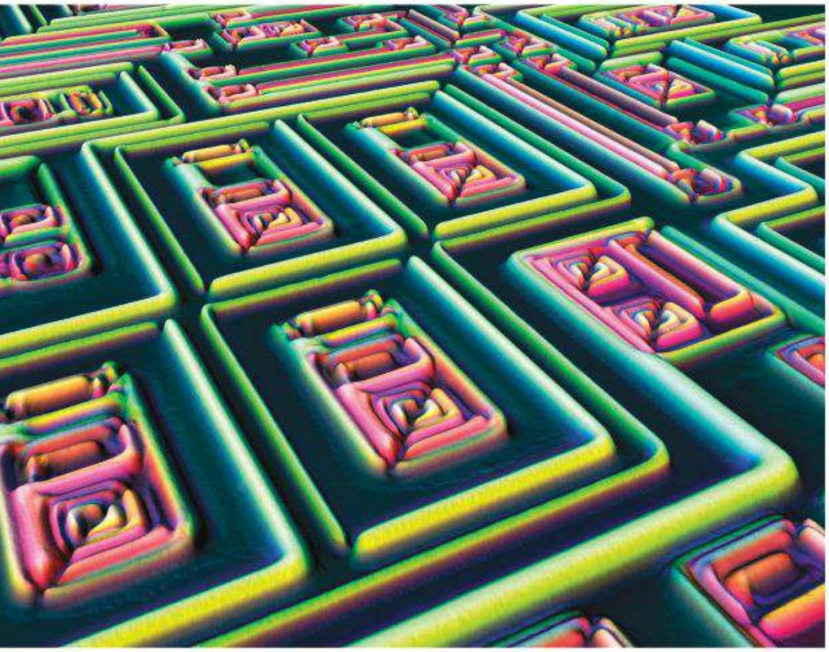
Other great advances have come by way of digital technology—both hardware and software. While until very recently he used color reversal film for its fine detail and color, Pasieka has now gone fully digital. "It's very difficult to get the film developed now—I mean, speedily—and the advantages of shooting digital are all too convincing," he says.

Among his latest equipment is the Nikon DS-Ri1 camera, whose cooled image sensor uses

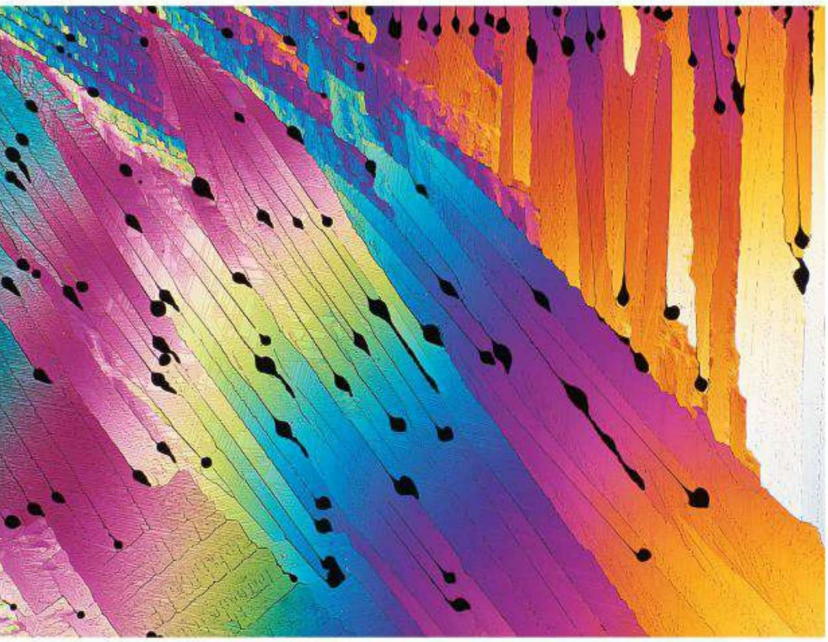
CONTINUES ON PAGE 110



MELILOTUS OFFICINALIS
A 33X image shows the central vascular tissue of the root of this plant, better known as sweet clover. Leica/Zeiss scope used with 6x7cm rollfilm back to make image on Fujichrome 50 Tungsten.



MICROCHIP SURFACE
Several micrograph images were used to create a 3-D rendition in Cinema 4D software. A Canon EOS-1Ds Mark III body was mounted on a Zeiss Axio Scope microscope to make the exposures. Magnification, 500X.



CAFFEINE CRYSTALS
Crystaline form of the world's favorite alkaloid stimulant, seen here at 80X. Leica/Zeiss scope (see photo at right) used with 6x7cm rollfilm back to make image on Fujichrome 50 Tungsten.

Scoping Out Micro Gear

THE COMPOUND optical microscope is basically a tube with an objective lens (or array of lenses) at one end, and an eyepiece lens (ocular) at the other. Some of the big names in photo equipment, such as Leica, Nikon, and Zeiss, are also biggies in pro-level microscopes—and they were so before they started making cameras.

Digital microscopes are optical microscopes with an image sensor replacing the ocular. These can range from inexpensive handheld models with USB output, to larger stand models with built-in LCD monitors. These scopes can capture images via the sensor; small handheld scopes typically have resolutions around 2MP, while higher-end models range from 5MP to 8MP. Celestron (www.celestron.com) makes a range of consumer-level optical and digital scopes.

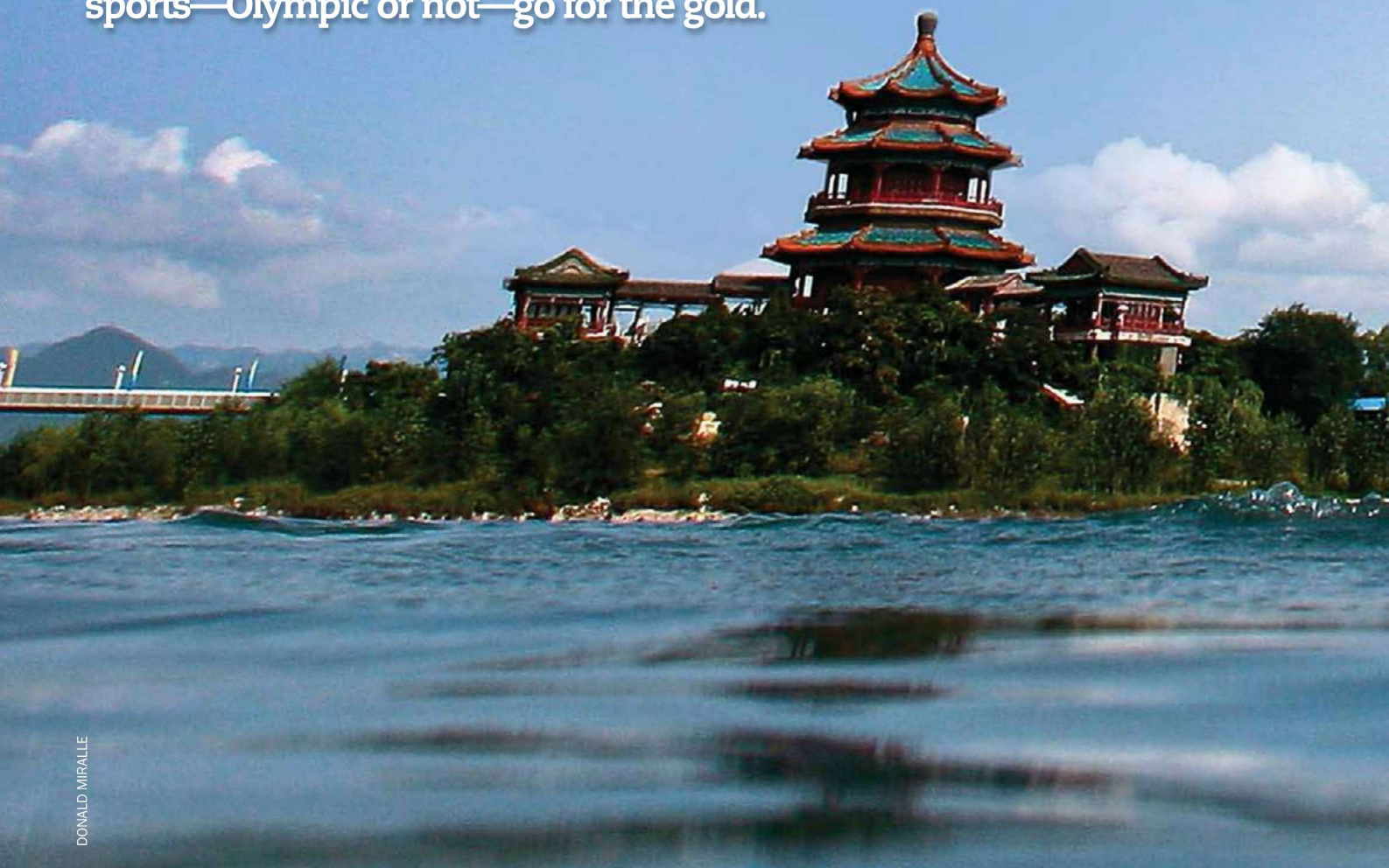
Looking to get into micrography? Alfred Pasieka suggests "a consumer-level compound microscope with an adapter for an existing DSLR, or even a compact camera. There are a lot of solutions for adapting them, and with most of them you can have live view on the LCD screen. You mount the DSLR body either directly to the scope with the help of an adapter or mount it on a macro stand over the scope."

His Leica microscope, shown here, uses a Zeiss macro stand to attach it to his Canon DSLR. You'll find many adapters for cameras at www.microscope.com/imaging/camera-adapters/.

Shooting the Gold Rush

By Peter Kolonia

This month, the greatest athletes of our day descend on London for the 30th Olympiad. Along with them come some of the world's most accomplished sports photographers, who will fly in mountains of the best and most expensive cameras and lenses, their planners stuffed with schedules and notes, and their nerves steeled for a marathon of shooting across three relentless weeks. We interviewed five of these tested pros, and their insights should help all shooters of organized sports—Olympic or not—go for the gold.



DONALD MIRALLE

UP AND OUT Chinese triathlete Zhang Yi exits the water during the Women's Triathlon at the Beijing 2008 Olympics. To get a watery foreground, Don Miralle mounted his Canon EOS 5D and 14mm EF on a boom and extended it over the water.

Getty Images photographer Streeter Lecka puts it best: "The Olympics are unlike anything you will ever shoot in sports," he says. "For professional shooters, it's our Super Bowl. The competitive spirit that the athletes feel, we feel. We're all going for that iconic picture that will forever go down in Olympic history. We're there to capture it in real time, under nerve-racking pressure, because in competitive sports shooting, there's never a 'do over'." Preach it, brother.

With the Olympics, as with all organized sports, photographers fight two battles. One has to do with the logistics of covering such a massive event, with its crowds of people and unending stream of forms, schedules, and permissions. Chances are, you'll never face that particular fight.

But the other is entirely photographic—and it's one that anyone who shoots any sport, at any level of competition, faces. You have to bring the right gear for each event, find a great vantage point for capturing it, and figure out just how to add your own visual twist that will lift your pictures above all others.

Planning Matters

Photographically preparing for the Olympics begins months before the opening ceremonies. Every day and every event you cover must be carefully scheduled in order to make the most of the opportunities. "There are some days when you're scheduled to be at three different venues, each in different light, with different shooting positions that can require completely different gear," says Donald Miralle, who has covered the Olympics for *Newsweek* (www.donaldmiralle.com). "In advance, you need to figure out what access you will need, where the venues are located in relation to each other, and how much time it takes to get from point A to B to C."

Ron Wyatt, a New Jersey-based pro who has covered the past two summer Olympics for Kodak (www.ronwyattphotos.com), speaks bluntly of the logistical challenges. "Traveling between venues is probably the single hardest thing about covering the Olympics," he says. "Buses leave every half-hour between venues. My goal was to shoot three to seven events per day, and often, to fit them all in, I had only 20 minutes for each sport."

So whether you're covering a high school or college athletic meet or trying to cram in as much Olympic action as a spectator can, always have a plan B. If you decide (or were assigned) to shoot weightlifting, for example, and the backgrounds there are a disaster, or, for whatever reason, the event is off schedule, cut your losses: Fire off a few shots, pack up, and head off to your preplanned B event.

During the preparation stage, one of your first responsibilities is learning the Olympic planning committee's guidelines for photographers. In London, for example, visitors are prohibited

OLYMPIC INSIGHT

Mark Rebilas, freelance

"I would say that shooting the Beijing Games, I considered myself very lucky if I got six hours of sleep a night. My friends think that when I fly off to cover the Olympics, I must be having the time of my life. Guess again! Between the nonstop stress and the lack of sleep, it's murder."

HAIL MARY For his 2008 Beijing shot of a celebrating women's water polo team, Mark Rebilas had to hoist his Nikon D3 over the heads of a gaggle of other photographers. Even with unimpeded views, however, he always shoots a Hail Mary (or two) just to offer his editors a variety of vantage points.

TELE TRICK This image of Michael Phelps, taken seconds before a gold medal finish in Athens, 2004, shows the power of the supertele. Dave Black got the shot with a Nikon 600mm f/4 by climbing up into the stands to gain a direct line-of-sight into the athlete's face.

MARK J. REBILAS (WATER POLO TEAM); DAVE BLACK (MICHAEL PHELPS)

from bringing lenses longer than 11.8 inches (30cm) in length, nor can they bring tripods or monopods. Professional photographers with media credentials are allowed monopods, but not tripods. Some venues will have flexibility in how thoroughly they enforce these limits, though, depending on the crowds and space availability.

Familiarize yourself beforehand with the venues that you will be working. Wyatt suggests that you consider the context: "Do you need a high angle from the stands or a ground-level vantage point? Would shooting straight into the competitors' eyes or capturing them in profile work best? Especially if you're new to the sport, find out what vantage points will and won't work by researching on Google and Flickr."

If you can't get permission to shoot from the best vantage points, find another event.

Know Your Sports

After you've got logistics and scheduling down, Lecka says that the next step is to research the sports and athletes you will

be covering. "It's important to know who is who, and what physical tendencies they may have," he says. "You can score great images by knowing the athletes and how they react to winning or losing. Some athletes are physically demonstrative, striking iconic poses that can make a great photograph. You need to learn in advance who will produce these poses and make sure you're in position to capture them."

The great sports shooter Dave Black (www.daveblackphotography.com), for example, knows all of Michael Phelps' moves, which helped Black get the image on the previous spread during the 2004 Olympics in Athens. "I had memorized Michael's freestyle stroke pattern and knew that he would take a breath two strokes after the 50-meter mark," he recalls. "Knowing this, I picked an appropriate upper-level camera position so that I could shoot slightly above the splashing water and capture a single image of Michael's face. It was his last breath before sprinting to win a gold medal."

VANTAGE ADVANTAGE
Ron Wyatt chose this low camera angle for Misty May-Treanor of the U.S. because, "when shooting volleyball, it's a great way to crop out the net."

In planning and plotting your schedule, try packing it with the most photogenic sports. Ron Wyatt likes gymnastics. "Finding a clean background can be dif-

PAN MAN **Streeter Lecka says, "Panning is a uniquely effective way to convey movement in a photo." Here, he captured Sweden's Susanna Kallur sharply in the Beijing hurdles, while rendering all else a smear of motion blur. His shutter speed? A sluggish 1/32 sec.**

ficult with gymnastics, but the uniforms are colorful and tastefully designed, and the actual movements are so graceful that it's almost a challenge to do it justice in your pictures," he says. "It's as close to working with professional fashion models as you get in sports."

Lecka responds to the aquatic events. "First, they're great because those of us with media credentials have so many unusual vantage points at our disposal. Most times you can shoot directly above the pool, at pool level, from the stands, and even underwater. The speed and grace as the athletes glide through the water makes it all the more interesting."

Al Bello (albello.com), also with Getty, agrees. "Adding water into the photographic mix gives you beautiful blue backgrounds, shimmering reflections of light, and sometimes, a sparkling quality. You can also add a nice graphic punch by carefully placing the black lane lines in your compositions," he adds.

Conversely, some sports make it hard to get iconic images. For Bello, these include rifle shooting and archery—all the competitors use identical, static poses and body language. "And your choices for camera angles and compositions are limited. You can't get in front of your subjects, for one thing," he laughs.

Olympic photographers must also prepare themselves on a physical level. Covering the games is exhausting. Before arriving, you must be thoroughly rested, healthy, and ready to hit the ground running—literally.

Black says, "Covering the Olympics is like photographing three Super Bowls per day for 16 consecutive days. It can be very tiring and sleep is an absolute premium. [Pro] photographers might get four hours a night—if they're lucky. They eat on the run, download and transmit images to their editors directly from the events, endure long hours of concentrating through their viewfinders, and carry up to four camera bodies with a 14–24mm, 24–70mm, 70–200mm, 200–400mm zoom, a 400mm f/2.8, and a 600mm f/4, along for the ride, plus two

OLYMPIC INSIGHT

Streeter Lecka, Getty Images

"What might surprise readers about covering the Games? The fact that the actual photography is often the easy part. Between the difficulties of dealing with the crowds, the transportation system, the scheduling, and more, when the shooting actually starts, I'm in my comfort zone, and can almost relax."

RON WYATT (VOLLEYBALL); STREETER LECKA/GETTY IMAGES (HURDLES)

Speedlights, a monopod, and a laptop up and down stairs, to and from shuttle busses to each venue, as they try to cover three or more events per day."

Lecka suggests bringing as many healthy snacks as you can cram in your luggage.

Shooting Skills

Once preparations are behind you and you've arrived at the games, it's time to start photographing. "Don't wait until an event starts to begin shooting. Get out early and shoot the warmups. You need to get used to photographing the action," says Wyatt.

"A photographer may shoot a thousand pictures at an event, and almost always the first 100 have the lowest percentage of sharp, well-composed pictures, and the last 100 have the highest. That's because it takes time to get into the rhythm of a sport, and for each sport it's different. So I say, shoot warmups, and warm yourself up along with the athletes."

One of the best techniques for bringing home the gold, photographically speaking, is panning with moving subjects as Lecka did with his shot of Sweden's Susanna Kallur competing in the hurdles in Beijing on the previous spread. "Panning is a high-risk, high-reward technique, but is well worth the challenge. It opens the doors to a whole other artistic side of photography" he says.

"The two key ingredients are shutter speed and background. The slower the shutter speed and more graphic the background, the better the pan will look. However, the slower you go, the less likely you will get the subject sharp."

Lecka's tips for great pans: Stand as still as possible and follow through with the subject while opening the shutter. Keep moving until after you hear the shutter close, and make that movement as smooth as possible. "Don't get frustrated if your subject is blurred, because panning isn't as easy as it may look. It's a skill that takes time and practice to master."

For sharper photographs, says Wyatt, "I don't use the shutter button to focus—I use the back button. Both Nikon and Canon systems allow you to focus by pushing one of the rear body buttons, and the advantage is that, by keeping this button depressed, your shot is already in focus when you hit the shutter release. The result is a lot more in-focus pictures." On DSLRs that lack dedicated AF buttons, you can often assign this function to a custom control instead.

Lens selection is also a paramount concern. "Outdoors, I use a 200–400mm f/4 Nikkor Vibration Reduction zoom. I had a 300mm and a 400mm f/2.8, but I fell in love with the 200–400mm," says Wyatt

For him, this 7.45-pound zoom is worth the nearly $7,000 price tag because it lets him handhold the camera (the 400mm f/2.8, at 10.2 pounds, requires a monopod), and the benefits of zooming are impossible to overstate. "The guy shooting a super tele has to set the lens down when the action gets too close to him, and during those moments, he's losing precious images," he says. "My zoom helps me avoid that."

He adds, "For anyone on a budget, though, I recommend the Sigma 120–300mm f/2.8, because it's light enough to handhold and is about $3,500 cheaper. It's my second-favorite lens for sports."

For more on equipment, see

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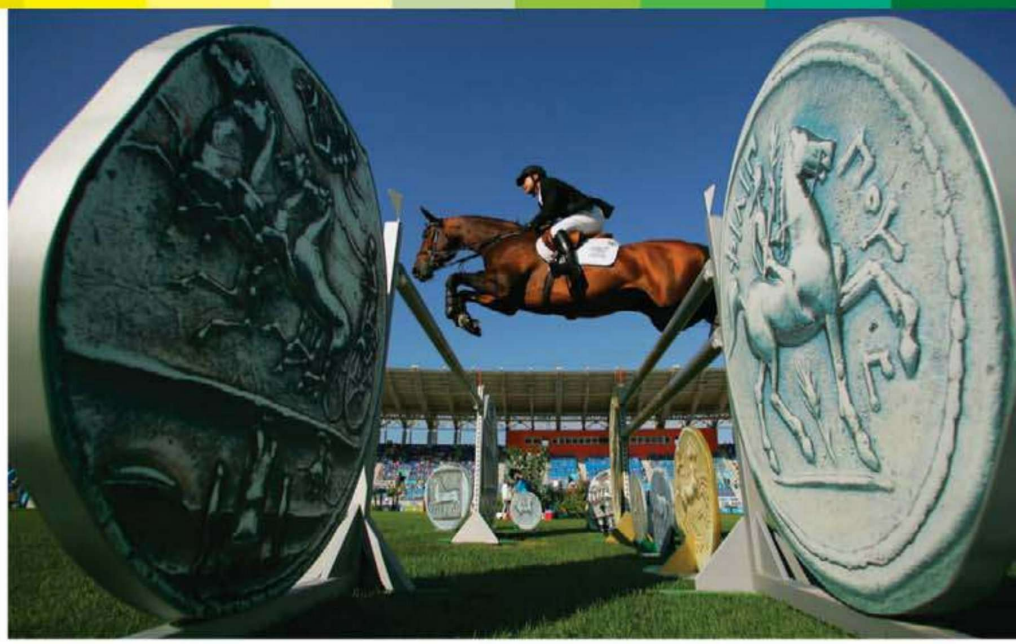


DONALD MIRALLE (SYNCHRONIZED SWIMMERS); AL BELLO/GETTY IMAGES (EQUESTRIAN)

LEAP OF FAITH
"For this show-jumping shot made during the Athens summer Games," says Al Bello, "I had to convince the site manager that the EOS-1D Mark II that I was firing remotely wouldn't bother the horses. He refused at first, but ultimately relented, and I got my shot."

WHEN B&W RULES
"I usually like color," says Don Miralle of the Canadian swimmers in Beijing here, "but when color isn't pertinent, and the scene is heavy on graphic elements, b&w can be best."

OLYMPIC INSIGHT

Don Miralle, freelance

"My parents took my sisters and me to the 1984 Olympics in Los Angeles, and I immediately knew then, while waving my American flag cheering for our athletes, that the Olympics would always be part of my life. Little did I know that I would cover seven Games."

Gear Run

By Dan Richards

We asked our pro sports shooters what they're bringing (or what they *would* bring) to the London Olympics this year. It makes for quite a list—but would it be the right stuff for your own sports photography?

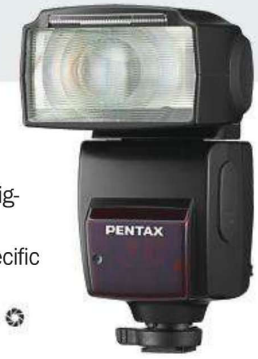
Cameras

PRO CHOICE: The Canon and Nikon supercameras, such as the EOS-1D Mark IV and the D4, are weapons of choice for their top image quality, bulletproof build, and blazing fast burst rates.
REALITY CHECK: Pros also rely on less expensive, lighter, and smaller APS-C models, which give you more effective focal-length reach due to lens factor. Almost any consumer DSLR these days can make a good sports rig—consider the $698 Sony Alpha 57, with its pro-level AF speed and rapid-fire bursts, up to 12 fps.

Lenses

PRO CHOICE: Obvious. The premium-line, super-rugged, high-speed optics like the Canon and Nikon 70–200mm f/2.8 grenade launchers.
REALITY CHECK: Sports pros often don't have to carry exotic lenses; camera makers provide equipment tents at major events. For the offspring's soccer match, we'd consider an all-in-one such as the new $499 Sigma 18–250mm f/3.5–6.3 DC Macro OS, a full-frame equivalent of 27–375mm or 29–300mm on APS-C bodies.

Flash



PRO CHOICE: Our sports guys commonly carry four to six high-end accessory TTL flash units for wireless multi-light setups.
REALITY CHECK: Every serious photographer should have a high-end TTL unit—such as Pentax's AF-540 FGZ—for the extra power, wireless operation, high-speed sync, and more. Six may be overkill, but two makes sense if you shoot indoors where flash is allowed.

Clamps

PRO CHOICE: Clamps, such as the Manfrotto Super Clamp, are a must for rigging gear in places like gym rafters.
REALITY CHECK: Unless you have a specific application in mind—and permission for it—they're mostly superfluous.

Radio Remote Trigger

PRO CHOICE: Triggers like the PocketWizard are a must for setting up cameras in an out-of-the-way position, or a place where the photographer is not allow to stand. They can also fire flash units out of the range or sightline of the camera's TTL trigger.
REALITY CHECK: If you do the kind of shooting that involves remote-mounted cameras or flash units, these gizmos are pretty much indispensable. If not, save your money and camera-bag space.

Teleconverters

PRO CHOICE: Pro shooters almost always have matched teleconverters for their long lenses in their must-take kits.
REALITY CHECK: We're with the pros here. High-quality matched telecoverters such as the Tamron SP AF Pro can boost your long lens by 1.4X or 2X with practically no weight or bulk penalty. Keep in mind, though, that these converters are matched for faster, higher-end optics—kit zooms need not apply.

YOU MIGHT NOT THINK TO BRING:

- **Knee pads, for low-angle shooting.**
- **Flat foot for a monopod—it prevents horizontal rotation.**
- **Underwater housing for events in which the camera will get wet.**

LOOKING FOR

CA$H?

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The Cloud Now

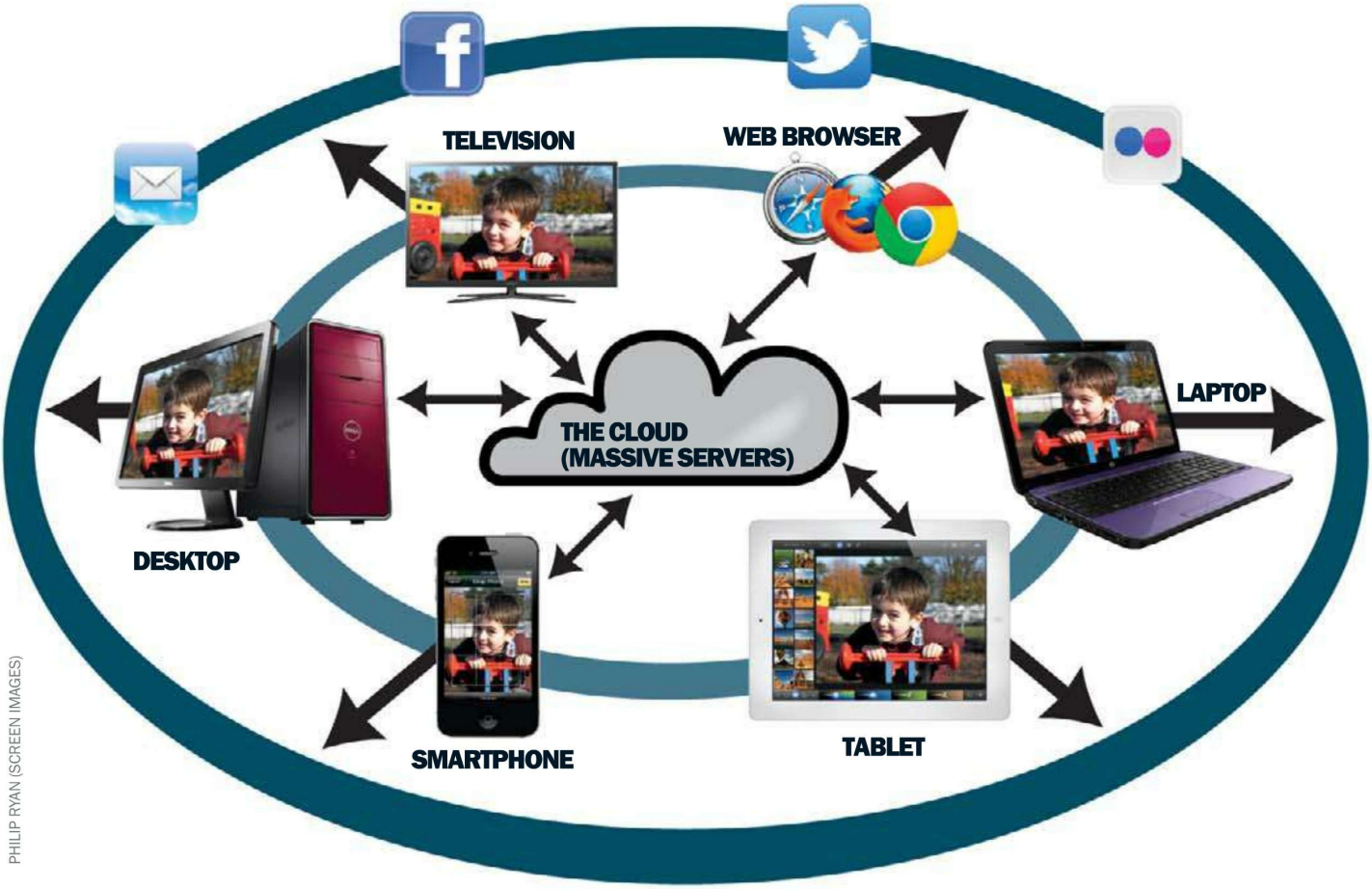
By Debbie Grossman

AUTOMATIC ACCESS TO ALL YOUR HIGH-RES IMAGES, IN EDITABLE, DOWNLOADABLE, AND SHAREABLE FORM—ANYWHERE, ANYTIME, FROM ANY DEVICE. THAT'S THE DREAM OF SO-CALLED CLOUD STORAGE.

While not quite equal to the dream yet, today's cloud-based services let you download apps to your computers and mobile devices, and automatically sync to download, share, and sometimes edit your images and other files wherever you are.

Storage space is still limited: 100GB is the usual maximum, and this will generally cost you around $100 per year. Most services prefer one operating system or another; some play nicer with photographs than others; and some share more elegantly than others.

But all of these services offer about 5GB of storage for free, so there's no reason that every photographer shouldn't use one (or a few) of these cloud services to make sure your best high-resolution images are backed up and available, no matter what.



PHILIP RYAN (SCREEN IMAGES)

APPLE iCLOUD

Switch on iCloud for your iOS devices, and it works in the background to sync and back up your data. Photo Stream does iCloud's photo backup: It keeps your last 1,000 photos on your mobile devices and saves full-res versions on all of your computers.

What's Hot

- It's automatic, and iPhone and iPad users never have to worry about backing up and syncing their stuff.
- Photo Stream doesn't count against iCloud storage.

What's Not

- Mac users must use Aperture or iPhoto to manage Photo Stream images (PC users just drag and drop in and out of a folder).
- Shared albums won't come until iOS 6 releases in the fall.

Specs

- iOS device required; backs up to Mac or PC.
- 5GB free; 50GB, $100 per year.

DROPBOX

Install Dropbox on your computer, and it creates a special folder on your hard drive. Anything you copy to it will be available on any other machine with Dropbox installed, on any mobile device with its app installed, or via the Dropbox website.

What's Hot

- Easy to use, with clear and brief online tutorials.
- Can automatically back up camera and mobile photos.

What's Not

- Photos must be copied to one of two dedicated folders within the Dropbox folder to share using special photo features.
- Non-JPEG image previewing is spotty.
- Pricey.

Specs

- Works with PC, Mac, Linux, iOS, Android, Blackberry, and web browsers.
- 2GB free; 100GB, $199 per year

GOOGLE DRIVE

Files and folders are synced via the Google Drive folder on your computer. Documents, spreadsheets, and other files that you create using Google's online apps are automatically downloaded to your machines. Anyone who uses Gmail already has a Drive account.

What's Hot

- Sharing is robust, making it easy to collaborate, particularly on documents.
- Use your storage space for keeping photos on Picasa, Google's photo-sharing service.

What's Not

- Non-JPEG image previews are hit or miss.
- No iOS app (as of mid-June).
- No online slideshows.

Specs

- Works with PC, Mac, and Android, plus web and mobile browsers.
- 5GB free; 100GB, $60 per year.

MICROSOFT SKYDRIVE

Much like Google Drive, SkyDrive syncs your files using a special folder on your computer. Also as with Google's service, you can create and share documents, in this case using online versions of Microsoft's Office apps.

What's Hot

- Reliably displays previews of RAW files, high-res TIFFs, and JPEGs.
- Online- and app-based photo interface and slideshows are nicely designed.

What's Not

- We hit a few bugs while attempting to share files by email.
- Doesn't always sense when an image should be rotated vertically.

Specs

- Works with PC, Mac, iOS and Windows Phones, and using third-party apps for Android devices.
- 7GB free; 100GB, $50 per year.

SUGARSYNC

A little bit more complicated than the others, but a little bit more powerful, too. Designate any folder on your computer to sync, without rearranging your files.

What's Hot

- Web and mobile apps automatically create photo galleries of the images inside your synced folders.
- Photo slideshows are presentation-worthy.
- Works on nearly every platform.
- Shared stuff can be password-protected.

What's Not

- Only JPEG image previews are reliable.
- Setting up syncing among devices takes some learning.

Specs

- Works with PC, Mac, iOS, Blackberry, Windows Mobile, Android, Symbian, Kindle Fire, and web browsers.
- 5GB free; 100GB, $150 per year.

ADOBE REVEL& CREATIVE CLOUD

Most of the other cloud storage and syncing services listed here are aimed at people who focus as much on documents and other files as they do on photos. Adobe has come out with two decidedly different image- and design-focused cloud services: Revel and Creative Cloud.

However, neither hits the sweet spot for photo enthusiasts. Revel best suits consumers, and Creative Cloud is aimed at graphic designers and imaging pros who work in groups and use the whole Creative Suite set of applications.

We're still holding out for a service that tightly integrates with Photoshop and Lightroom, works with RAW, and shares and displays images beautifully.

REVEL

Use the Revel applications to import images and edit them on your Mac (there's no PC support) or your iOS device (Android is still in the works). Your photo library and your edits sync across all supported devices. The service costs $6 per month. It's beautifully designed, but without RAW support or true Lightroom integration, it is, if anything, a supplementary tool for serious shooters.

CREATIVE CLOUD

The subscription fee ($50 per month if you subscribe for the year) for Creative Cloud allows you to download, install, and use any of the latest CS apps on your own machine. The service is built for collaboration and is tightly integrated with the Creative Cloud website. There you can manage and upload files to share, download them to edit, and give feedback on files uploaded by others.

INTRODUCING!

POP PHOTO POSES with Lindsay Adler

Wedding Poses

PopPhoto Poses with Lindsay Adler is the essential posing guide for photographers looking to add creative and unique posing options for their clients.

Each photo includes the tips and techniques to easily direct and shoot the bridal couple on their special day.

Back
Popular Photo Poses with Lindsay Adler
Dip and Kiss
Lens 85 mm 1.4
Aperture f/2.2
ShutterSpeed 1/500 sec
Focus Length 85 mm
ISO 200
Prompts and Tips
Lighting and Setup
Effects
Bride and Groom are facing each other, his front arm at his side, his back arm reac
supporting her. Groom is leaning in to kiss the Bride, who is leaning back (in a dip
arm hangs straight at the shoulder, holding her bouquet. A low camera angle helps
look taller and more slender.
Posing Overview
Video & Tips
My Favorites
Back
Popular Photo Poses with Lindsay Adler
Posing Overview
Video & Tips
My Favorites
Settings

NOW AVAILABLE FOR iPHONE AND iPAD!

Lindsay Adler is a portrait and fashion photographer based in NY. Her images have appeared in dozens of publications internationally. Lindsay has authored two photography books and teaches thousands of photographers annually how to improve their vision and craft.

PopPhoto Poses with Lindsay Adler

Available on the App Store

LAB

AUTHORITATIVE TESTS, REVIEWS, AND BUYING ADVICE

TESTS: OLYMPUS OM-D E-M5 AND SIGMA 50–150MM F/2.8 EX DC OS 78

TEST: NIKON 85MM F/1.8G AF-S NIKKOR 82

84

DSLR TEST

POWER PACK

Nikon defines its "entry-level" DSLR way up—by 10 million pixels or so.

SATOSHI

NORMALLY, WE don't expect a camera maker's entry-level DSLR to have more pixels than its pro-level bodies. Yet, here we are, with a test of Nikon's new 24.2MP D3200 just a couple of months after having tested its top-of-the-line 16.2MP D4. Plus, both cameras produce superb image quality up to ISO 800. Of course, the $6,000 (street, body only) D4 is much more camera than an entry-level shooter needs. It has faster autofocus with better tracking, stratospheric sensitivity with lower noise, and much speedier bursts, to name a few of its many benefits. Yet, the D3200, at $699 (street, with 18–55mm f/3.5–5.6 VR lens), delivers the

NIKON D3200

24.2MP APS-C CMOS sensor
4-fps burst shooting
1920x1080p30 video capture
ISO 100–12,800
$699, street with 18–55mm f/3.5–5.6 VR zoom lens

most resolution we have ever seen at this price. Nikon has also managed to keep noise levels on par with, or better than, its earlier D3100 while adding 10 million more pixels.

In the Test Lab

With resolution well past our cutoff for an Excellent rating and impressive noise control, the D3200 claimed an overall image quality rating of Excellent from its lowest sensitivity of ISO 100 all the way through ISO 800; the D3100 achieved an Extremely High rating across the same range of sensitivities. The only other entry-level DSLR to rate Excellent in overall image quality in our tests is the Canon EOS Rebel T3i, which did so only up to ISO 400. Plus, despite being more than a year old, the T3i still streets for about $100 more than the D3200, which, given all those pixels, outresolves it.

Just how much resolution are we talking about? The D3200 was able to resolve a whopping 2710 lines per picture height at ISO 100. By ISO 800 it drops to 2570 lines—still above our cutoff of 2500 lines for an Excellent rating. (This is also very slightly ahead of the Canon T3i's 2550 lines at ISO 100.)

Color reproduction proved quite accurate, with an average Delta E of 6.5. This score easily earns the D3200 an Excellent rating. While most DSLRs these days are capable of earning an Excellent mark in this criterion, it's still gratifying to see it clear

NIKON D3200
WHAT'S HOT
Excellent image quality through ISO 800.
WHAT'S NOT
LCD screen fixed instead of articulated.
WHO IT'S FOR
Anyone looking for a budget DSLR or a low-cost entry to the Nikon system.

LINZEE LICHTMAN (LCD IMAGE)

the hurdle so handily.

One thing to note here is that the D3200's Neutral picture control setting, while accurate, shows less contrast and saturation than we're used to seeing. This is hardly a problem, as you can easily add contrast and saturation when converting files from RAW. Better still, you can just select the Standard picture control setting if you find its color reproduction as pleasing as we did. Furthermore, each of the picture control settings is customizable, so you can change them as needed.

We were impressed that, despite all the resolution, the D3200 kept noise to a Low or better rating up to ISO 800. Even with its cleanest rendition, however, the D3200 couldn't achieve our top honors of Extremely Low in this test. Instead, it scored Very Low at ISO 100–400 and Low at ISO 800.

As a reality check, the vast majority of photographers in the film days never shot above ISO 800. Plus, for an entry-level

The info button, located behind the shutter button, can be used to turn the LCD screen off or on.

It might look as if Nikon's D3200 had only an overload of pixels in its favor, but take a closer look at its other strengths.

TEST RESULTS

IMAGE QUALITY ISO 100–800

EXCELLENT

POOR — EXCELLENT

RESOLUTION ISO 100

2710 EXCELLENT

1500 2000 2500 3000 3500 4000

POOR — EXCELLENT

COLOR ACCURACY

EXCELLENT 6.5

HIGH — EXCELLENT

NOISE AT ISO

VERY LOW 1.3	100
VERY LOW 1.2	200
VERY LOW 1.4	400
LOW 1.9	800
MODERATELY LOW 2.4	1600
◀ UNACCEPTABLE 3.0	3200
◀ UNACCEPTABLE 3.9	6400
◀ UNACCEPTABLE 5.9	12,800

3.0 2.5 2.0 1.5 1.0 0.5

UNACCEPTABLE — EXTREMELY LOW

HIGHLIGHT/SHADOW DETAIL

HIGH

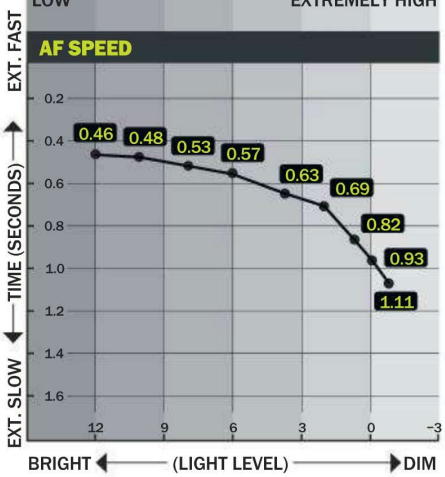
LOW — EXTREMELY HIGH

CONTRAST

NORMAL

LOW — EXTREMELY HIGH

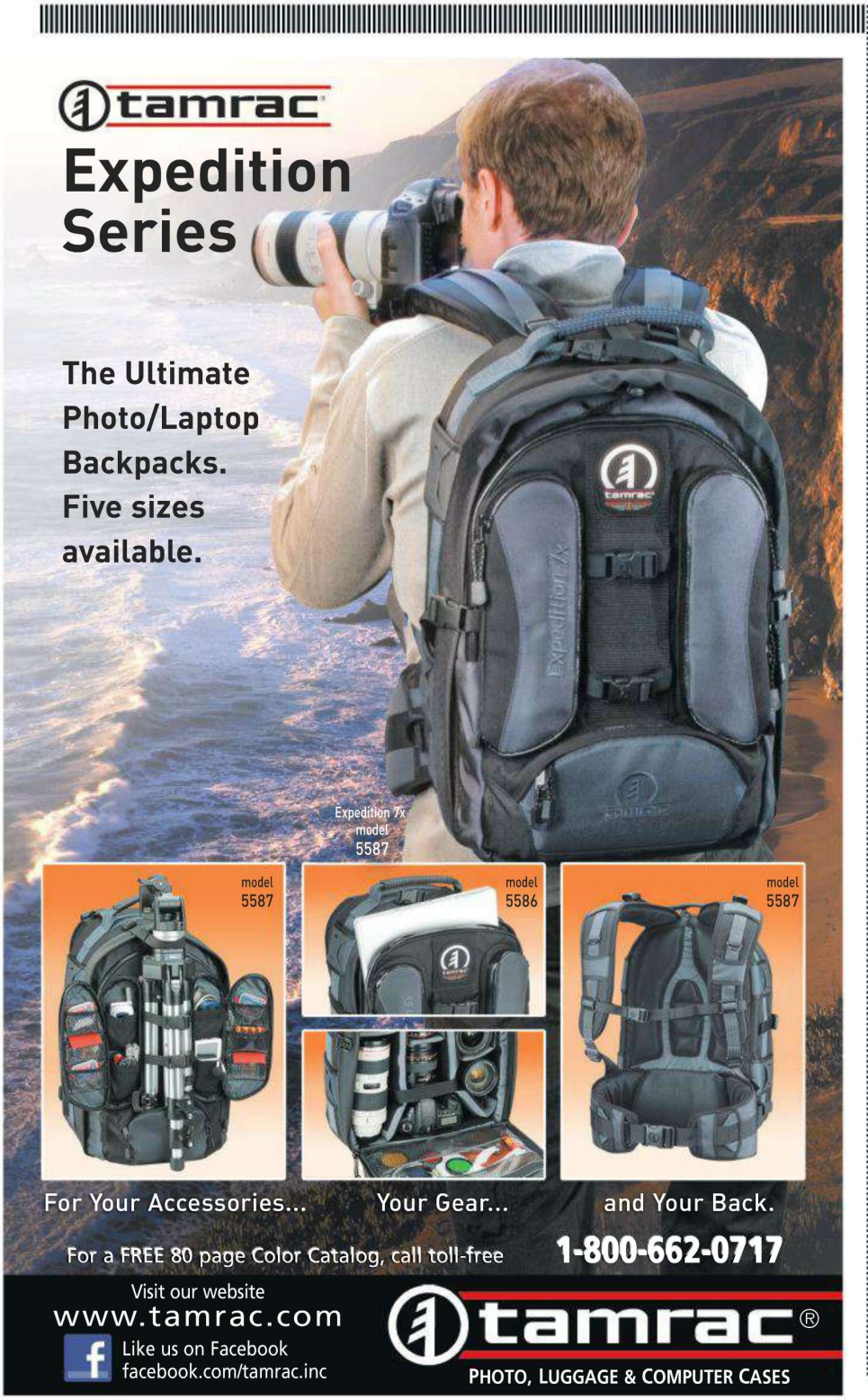
AF SPEED



DSLR, a Low noise rating at ISO 800 is quite rare. To deliver it while also maintaining enough resolving power for an Excellent resolution rating underscores the impressive image quality the D3200 provides.

In our autofocus test, the D3200's 11-point system focused in less than a second down to EV 0. At EV –1, the lowest light level at which Nikon rates the AF to be effective, the D3200's focusing became notably more erratic in the time it took to lock focus. Still, it was able to focus reliably, and averaged about 1.11 seconds to lock AF and capture an image.

For info on how we test DSLRs, go to PopPhoto.com/reviews.



SPECIFICATIONS

IMAGING: 24.2MP effective, DX-format CMOS sensor captures images at 6016x4000 pixels with 12 bits/color in RAW mode.

STORAGE: SD, SDHC, and SDXC. Stores JPEG, NEF RAW, or RAW + JPEG files.

VIDEO: Records up to 1920x1080p pixels at 30 or 24 fps in MPEG-4 H.264 format; built-in monaural microphone; stereo microphone input; continuous AF available; approx. 20-min maximum clip size at highest quality.

BURST RATE: Full-sized JPEGs (Fine mode), up to 80 shots at 4 fps; RAW, up to 18 shots at 4 fps; RAW+JPEG, up to 10 shots at 4 fps; using UHS-I SDHC card.

AF SYSTEM: TTL phase-detection with 11 illuminated focus points (one cross-type point in center); single-shot, continuous, 3D focus tracking; tested sensitivity down to EV –1 (at ISO 100, f/1.4).

LIVE VIEW: Full-time contrast detection, or single-shot phase-detection AF with mirror interrupting view momentarily; face detection and subject tracking available.

SHUTTER SPEEDS: 1/4000 to 30 sec, plus B (1/3-EV increments); shutter life not rated; flash sync to 1/200 second.

METERING: TTL metering using 420-pixel RGB sensor; Matrix (evaluative), centerweighted (75% weight given to 8mm circle in center of the frame), and spot (approx. 2.5% of finder at center); range, 0–20 EV (at ISO 100).

ISO RANGE: ISO 100–6400 (in 1- EV steps), expandable to ISO 100–12,800.

VIEWFINDER: Fixed eye-level pentamirror.

LCD: Fixed 3-in. TFT with 921,000-dot resolution, 7-step brightness adjustment.

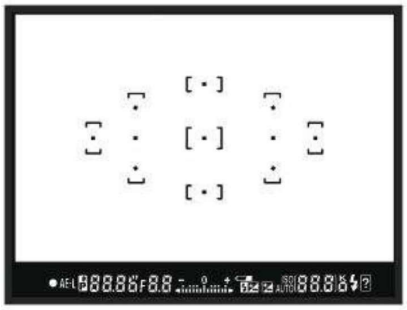
OUTPUT: Hi-Speed USB 2.0, mini-HDMI video, and composite video.

BATTERY: Rechargeable EN-EL14 Li-ion; CIPA rating, 540 shots with optical viewfinder.

SIZE/WEIGHT: 5.0x3.8x3.1 in., 1.1 lb with a card and battery.

STREET PRICE: $699 with 18–55mm f/3.5–5.6G VR AF-S DX Nikkor zoom lens.

INFO: www.nikonusa.com



VIEWFINDER TEST: Accuracy, 95% (Excellent); Magnification, 0.8X (Very Good).

Since the D3200 lacks a mechanical AF coupling pin, you need to use AF-S lenses if you want autofocus. For our testing purposes we used the G-series 50mm f/1.4; in the past, on other Nikon bodies, we've noticed a slight hesitation before AF begins with this and some other G lenses. With the D3200 though, AF was more responsive, resulting in slightly speedier AF than we saw in its predecessor, the D3100.

In the Field

Like most entry-level DSLRs, the D3200 is small enough that your pinky will likely end up tucked beneath the body. Still, the grip is comfortable and, although the camera has only one command wheel, we didn't have a hard time using it, unlike some others in this class. To change most settings, you'll have to use the control-panel interface on the LCD screen, accessed by pressing the *i* button on the camera back.

The burst rate of 4 frames per second is a welcome step up from the D3100's 3 fps. It's not quite up to what we like to use for sports, but it should work out fine for the shooters this camera is made for—and the 80-shot JPEG buffer capacity is enough to let you hold that shutter button down with utter impunity.

A dedicated video-recording button near the shutter button makes capture simple, and the resulting footage looks quite good. Although the camera will allow continuous AF while shooting video, this was sluggish and noisy with the kit lens. Unfortunately, this is typical of DSLRs, and we found the contrast AF in the D3200 noticeably faster than what we've seen so far in many video-capable DSLRs.

Bottom Line

Nikon's D3200 is a lot of camera for only $699. On paper it might look as if it had only an overload of pixels in its favor. But take a closer look at its other strengths—the ability to keep noise under control while delivering a serious increase in resolution over the previous model, plus beefed-up video with faster contrast AF and the more standard 30-fps capture rate—and you see that the D3200 has plenty going for it.

We expect that Canon's recently announced EOS Rebel T4i (see page 13) will provide fierce competition, given the phase-detect AF embedded on its imaging sensor and its articulated touchscreen. But, the new Canon is also slated to cost about $150 more than this Nikon, and it will cost even more if you want a lens that can take advantage of that embedded AF system during video capture.

Like most budget DSLRs, the Nikon D3200 sports a single SD card slot. With 24.2MP images, you'll want to make sure that you have a high-capacity card handy, and maybe a backup, too.

There are still plenty of photographers who don't care a whit about video capture or live-view shooting. For them, the D3200 is a fantastic choice. And for video shooters who don't want a fold-out LCD screen, it also makes a lot of sense.

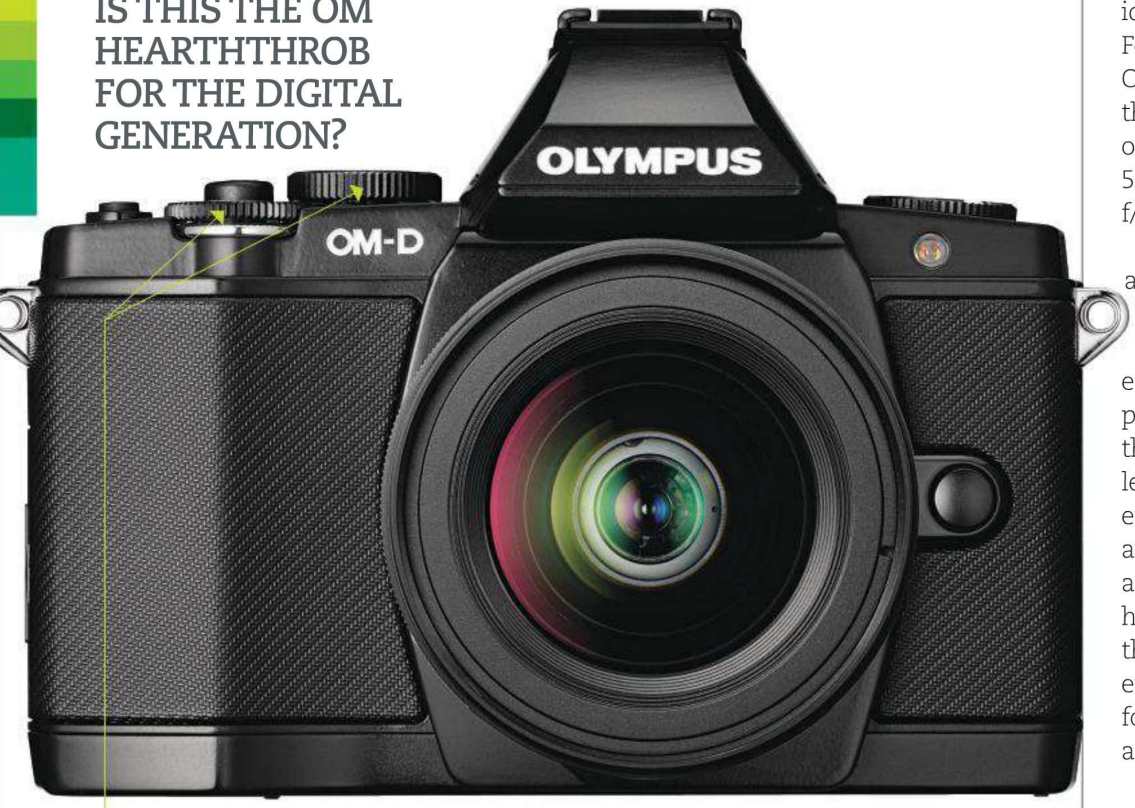
As the world continues to trudge through tough economic times, though, we think the value that the D3200 offers will be its biggest selling point, outside of the stunning images it is capable of capturing.

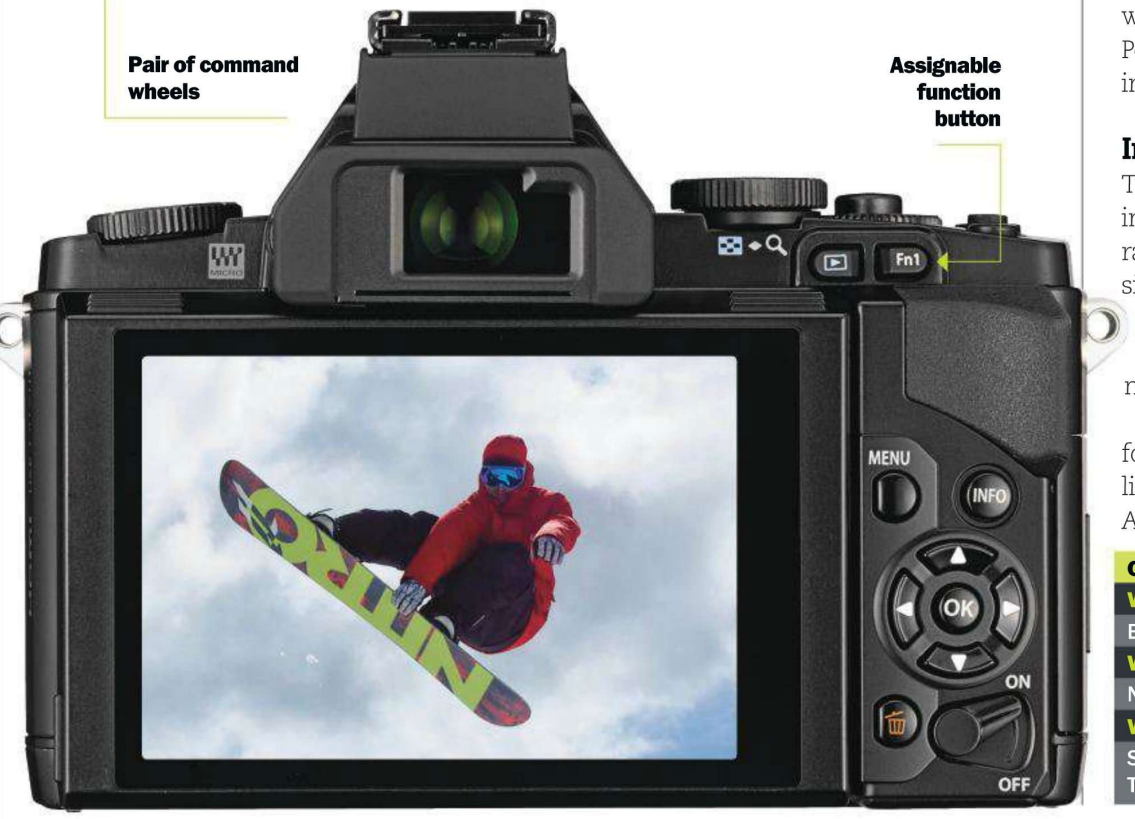
—Philip Ryan

AMATEUR PRO

OM Gee!

IS THIS THE OM HEARTHTHROB FOR THE DIGITAL GENERATION?





IN THE DAYS when we used to write with light on celluloid film, Olympus's OM-series of SLRs were deservedly revered. Now Olympus has resurrected the monicker to identify its high-end line of Micro Four Thirds cameras. Dubbed the OM-D, the new line debuts with the model E-M5 ($999, street, body only; $1,099 with 14–42mm f/3.5–5.6 lens; $1,299 with 12–50mm f/3.5–6.3 lens).

This 16.1MP camera boasts a 1.44-million-dot electronic viewfinder, 1920x1080i60 video capture, and weathersealing equivalent to that of the company's rugged E-5 DSLR. Moreover, the longer of the optional kit lenses (also weathersealed) covers an equivalent of 24–100mm and can switch between normal and electronic zooming. With the hold of a button and a slide of the zoom ring, the same lens can enter a macro mode that allows focusing as close as 7.9 inches for a magnification of about 1:1.4.

Of course, the question is how well the camera fared in the Popular Photography Test Lab and in our field tests.

In the Test Lab

The E-M5 earned top honors in image quality with an Excellent rating at ISO 200 (its lowest sensitivity) and ISO 400. Results were similar to Panasonic's Lumix DMC-GX1, though the E-M5 kept noise lower at all shared ISOs.

Resolution just barely qualified for an Excellent rating, with 2520 lines per picture height at ISO 200. And it managed to hold most of

OLYMPUS OM-D E-M5
WHAT'S HOT
Excellent image quality; weathersealing.
WHAT'S NOT
No built-in pop-up flash.
WHO IT'S FOR
Shooters looking for the best Micro Four Thirds body Olympus offers.

PHILIP RYAN (LCD IMAGE)

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Canon

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SAMSUNG

NX1000 NEW!

Style and Perfection, All in One

Samsung's mirrorless NX1000 interchangeable lens camera sports a 20.3MP CMOS sensor, a 3-" TFT LCD & records HD video at 30 FPS. Built-in Wi-Fi connectivity lets you connect to a wireless network. Save photos & videos directly to a computer or cloud service while you shoot, email them, print them wirelessly, or upload them straight to Facebook, Twitter or YouTube. You'll never have to worry about losing a great shot, running out of storage space, or remembering to bring the right cable along.

SONY

Alpha NEX-5N

Mini Marvel

Get a perfectly pocket-sized 16.1MP interchangeable lens camera made for capturing beautiful stills on the go at up to 10 frames per second. Record in Full HD 1080/60p or 24p video, take astonishing pictures in low-light with the large Exmor™ APS HD CMOS sensor or get beautiful panoramic shots in 2D or 3D. Put control at your fingertips with the highly responsive, conveniently tiltable 3.0" Live View touch screen LCD.

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New eyes for industry

AF18-270mm F/3.5-6.3 Di II VC (Vibration Compensation) LD Aspherical (IF) Macro

The Longest Steadiest Lens on Earth

The AF 18-270 covers an angle of view equivalent to that of a 28mm wideangle to a 419mm ultra telephoto with just one lens, letting the user capture once-in-the-lifetime images of panoramic landscape images or close-up pictures of children smiling, without having to get too close to the subject and without having to change lenses.

Camcorders

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Canon

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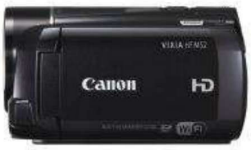
Pro Image Quality with Compact Convenience

The VIXIA HF M52 camcorder has 32GB of internal memory to record up to 12 hours of stunning HD video. Built-in Wi-Fi™ means you can immediately upload video directly to YouTube™, Facebook™ or your own home computer. Upload video anywhere with your iPhone™, iPad™ or iPod Touch™, and enjoy wireless viewing on your DLNA™-compatible TV.



Vixia HF M500 NEW!

A brilliant blend of capability and convenience.

VIXIA HF M500 sports a pro-level Canon HD CMOS Pro Image Sensor and a Flat Touch Panel LCD. Intelligent IS and SuperRange Optical Image Stabilization designed for Canon's 10x HD Video Lens make every scene clear and steady, and new built-in features make it easy to give your videos added creativity.

XA10 Pro HD

The On-the-go Videographer's Dream

This feature-rich, professional model records Full HD 1080p to either its 64GB internal flash drive or 2 SDXC-compatible card slots. Including the ability to record simultaneously to both cards for instant backup. It includes a detachable handle for low-angle shooting and portability. A Genuine Canon 10x HD Video Lens delivers a wide, flexible zoom range (35mm equivalent range 30.4mm-304mm) and smooth, pleasing backgrounds.

Vixia HF R300

Express Yourself like Never Before

The VIXIA HF R300 is equipped with flexible features to suit your shooting and sharing needs. Superb imaging is ensured with Canon's 3.28 Megapixel Full HD CMOS Image Sensor and DIGIC DV III Image Processor. Full HD Video is steady and clear even at the large end of the 51x Advanced Zoom

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that resolution for the first half of its sensitivity range; by ISO 1600, the E-M5 delivered 2420 lines in our test. At its highest ISOs, resolution dropped significantly, but images still had enough detail for small prints or web sharing.

Color accuracy also garnered an Excellent rating, with a Delta E of 7.8 in our test.

As mentioned earlier, we were impressed with the E-M5's noise control, keeping it to a Low or better rating through ISO 1600. Furthermore, it didn't hit Unacceptable until ISO 6400, and even then only barely so. If you add in a touch more noise reduction at ISO 6400, you can easily bring it into acceptable territory without sacrificing much more resolving power than the default settings do.

At the E-M5's top two sensitivity settings, the noise is heavy, but, again, if you plan to print small or share online at smaller sizes, you may still get usable results, depending on the subject.

JPEG shooters should note that, as with Olympus's Pen E-P3, the E-M5's JPEGs end up taking on an almost mosaic-like look when images shot at higher ISOs are viewed at 100-percent magnification. You can minimize this in RAW conversion with finer controls over noise reduction, but these images won't look pretty if blown up too much.

Though small, the top of the E-M5 houses the mode dial, an assignable function button, video record button, shutter button surrounded by a command wheel, and a second command wheel.

In the Field

With an elegantly textured look, rugged build, and diminutive size, the E-M5's body design is admirable. We'd normally complain that the grip is too small, but we'll just advise you to invest in the HLD-6 Power Battery Holder ($299, street).

Though it sounds like a place to store extra batteries (and it is), the HLD-6 is actually a two-part accessory grip system. The first part screws into the camera's tripod socket and provides a beefier grip for horizontal shooting, as well as a duplicate shutter button and surrounding command wheel. The second part screws into the first and adds a vertical grip, a compartment for an extra battery (though it doesn't come with one), another shutter button and command wheel, and two assignable function buttons. With all this attached, the E-M5 resembles a tiny pro DSLR body.

This rugged little ILC may be all the camera you'll need.

DAN BRACAGLIA (CAMEA TOP)

TEST RESULTS

IMAGE QUALITY ISO 200–400

EXCELLENT

POOR — EXCELLENT

RESOLUTION ISO 200

2520 EXCELLENT

1500 2000 2500 3000 3500 4000

POOR — EXCELLENT

COLOR ACCURACY

EXCELLENT 7.8

HIGH — EXCELLENT

NOISE AT ISO

VERY LOW 1.2	200
VERY LOW 1.4	400
LOW 1.6	800
LOW 1.7	1600
MODERATELY LOW 2.2	3200
◄ UNACCEPTABLE 3.0	6400
◄ UNACCEPTABLE 4.3	12800
◄ UNACCEPTABLE 5.4	25600

3.0 2.5 2.0 1.5 1.0 0.5

UNACCEPTABLE — EXTREMELY LOW

HIGHLIGHT/SHADOW DETAIL

HIGH

LOW — EXTREMELY HIGH

CONTRAST

HIGH

LOW — EXTREMELY HIGH

IMAGE STABILIZATION AT 150MM

3 STOPS

1 2 3 4 5 6

There aren't a whole lot of dedicated buttons to change settings on the E-M5—actually, only two assignable function buttons. Other than those, you'll have to change settings through the 3-inch tilting OLED touchscreen on the camera back. A quick press of the OK button gets you to a control panel, so this is still a fairly painless process. Furthermore, since the camera has an EVF, you don't have to take your eye away to look at the OLED. This means that the lack of dedicated buttons doesn't become as much of a problem as it could on a DSLR.

A pair of command wheels keeps manual shooting simple. Likewise, a dedicated button for video recording makes movie-making simple.

The video footage from the E-M5 is on par with what we've seen from other ILCs recently. Colors are well saturated, video artifacts are kept to a minimum, and the footage is pleasingly sharp. Full-frame DSLRs have a minor advantage: With the right lenses, they can limit the depth of field more than current ILC systems. Still, we think that video from the E-M5 will be good enough for the vast majority of nonprofessional applications. We also wouldn't be surprised to see amateur filmmakers create stunning projects with this camera.

Autofocus relies on a contrast-detect system and is relatively rapid in bright light, but it becomes too slow to keep up with fast-moving objects in moderately dim light. Shooting an evening snowboarding competition that was lit about as well as a night baseball game, we had trouble locking focus quickly enough to get our shots when using a 75–300mm f/4.8–6.7 lens racked out to 300mm (a 600mm equivalent)—worth noting, as this slow zoom is the only current option for such a long focal length in the Micro Four Thirds format.

The next day, with snowboarders on the deck of a half pipe in bright sunlight, the E-M5 locked quickly on our subjects and had no trouble tracking them perfectly as they soared through the air, twisting and flipping the day away.

Burst shooting is limited to 3.5 frames per second with continuous AF and metering between shots, and sensor-shift image stabilization turned on. Turn IS off, and the rate speeds to 4.2 fps. When metering and focusing for only the first shot (with IS off) you can get up to 9 fps. Serious sports shooters will likely want faster bursts with IS, metering, and AF enabled. More casual action shooters, however, should be pleased with the E-M5's autofocus capabilities.

The Bottom Line

The Olympus OM-D E-M5 is a good-looking, fun-to-use camera capable of delivering wonderful images. But it doesn't come cheap. By the time you add a second battery ($50, street), the accessory grips, and the fancier of the two kit lenses, you'll end up spending well over $1,500.

Keep in mind, though, that this rugged little ILC might be all the camera you'll need for many years. And its small size means you'll be able to bring it with you almost anywhere. We fit the E-M5 (with the 12–50mm kit lens attached) in the pocket of a ski jacket and brought it out on the slopes without fear, thanks to the weathersealing.

Add the wide array of lenses available for Micro Four Thirds to the E-M5's other benefits, and you've got one heck of an ILC. To compare, Samsung's NX lens selection is nice, but its bodies so far have not kept up with this Olympus; Sony has an incredible body with the NEX-7, but its lens selection hasn't quite caught up with the combined output of Olympus and Panasonic. In time, this will change, but for now the Olympus OM-D E-M5 is one of the most attractive ILC bodies you can buy. *—Philip Ryan*

In addition to the wide array of lenses available for the Micro Four Thirds system, the E-M5 works with the various accessories, such as the PenPal wireless transmitter, that Olympus has already created for its Pen series of cameras.

SPECIFICATIONS

IMAGING: 16.1MP effective Four Thirds sized LiveMOS sensor captures images at 4608x3456 pixels each, with 12 bits/color in RAW capture.

STORAGE: SD, SDHC, or SDXC stores JPEG, ORF RAW, RAW + JPEG.

VIDEO: Up to 1920x1080i60 or 1280x720p60 MPEG-4/H.264 or Motion JPEG; built-in stereo mic; contrast AF with continuous AF in video mode.

BURST RATE: Full-sized JPEGs up to card capacity at 3.5 fps; RAW up to 17 frames at 3.5 fps.

AF SYSTEM: TTL contrast detection with 35-area Multi-AF, 1-area selectable AF, or 9-area selectable group.

SHUTTER SPEEDS: 1/4,000 to 60 sec, plus B (1/3-EV increments).

METERING: TTL metering with 324-area evaluative, centerweighted, and spot (approximately 1% of screen).

ISO RANGE: ISO 200–25,600 (in 1/3-EV increments).

FLASH: No built-in pop-up. Comes with FL-LM2 hot shoe flash: GN 10 (ISO 100, feet); covers 14mm lens field of view; flash sync to 1/250; allows wireless control of other flash units.

EVF: Fixed eye-level LCD with 1.44 million-dot resolution; 100% accuracy; 0.92X magnification.

MONITOR: Tilting 3-inch OLED touchscreen with 610,000-dot resolution.

OUTPUT: Hi-Speed USB 2.0; mini-HDMI video.

BATTERY: Rechargeable BLN-1 Li-ion, CIPA rating 360 shots.

SIZE/WEIGHT: 4.8x3.5x1.7 in., 0.9 lb with an SD card and battery.

STREET PRICE: $999, body only; $1,099 with 14–42mm f/3.5–5.6 lens; $1,299 with 12–50mm f/3.5–6.3 lens.

INFO: olympusamerica.com

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Prime Line

NIKON FILLS OUT ITS AMATEUR LENS RANKS

WHEN NIKON introduced its full-frame D4 for pros in January, it also had something for its amateur fans: the 85mm f/1.8G AF-S Nikkor ($500, street)—the fifth 85mm for FX bodies in its current catalog. This newest 85mm also belongs to another Nikon subset: It's one of a trio of fast f/1.8 primes, along with the 28mm and 50mm, that almost mirrors Nikon's famed trio of f/1.4 primes, the much-lauded 24mm, 50mm, and 85mm. The f/1.8s, however, are lighter, more compact, and significantly more affordable. Compared to the f/1.4, for example, the relatively new 85mm f/1.8 weighs half as much and comes in at less than one-third the price.

With internal focusing and a nonrotating barrel, the f/1.8 is suited for front-mounted accessories. The lens also offers manual focus in the autofocus mode, a rubber gasket around the lensmount, and Nikon's quiet SWM focusing motor. Its faintly stippled matte-black surface sets off the gold barrel markings, which include a depth-of-field scale for, alas, only one aperture: f/16. (The f/1.4's scale is the same.)

Among its pleasures: a smooth-turning, rubberized, manual-focus ring that's more than half an inch wide. And unlike Nikon's D-series 85mm f/1.8, this G-series lens sports a reverse-mounting shade for easy stowage and transport.

CONTINUES ON PAGE 100

NIKON 85MM F/1.8G AF-S NIKKOR
WHAT'S HOT
Great speed, focal length, and price.
WHAT'S NOT
AF and MF audible in some video.
WHO IT'S FOR
Anyone who wants to experience the joys of f/1.8.

SATOSHI

SPECIFICATIONS

85MM (85.24mm tested), f/1.8 (n.a. tested*), 9 elements in 9 groups. Focus ring turns 90 degrees.
DIAGONAL VIEW ANGLE: 28 degrees.
WEIGHT: 0.78 lb. **FILTER SIZE:** 67.
MOUNTS: Nikon AF.
INCLUDED: Lenshood, case.
STREET PRICE: $500.
WEBSITE: nikonusa.com

TEST RESULTS

DISTORTION: 0.05% (Imperceptible) pincushion.
LIGHT FALLOFF: Gone by f/2.5.
CLOSE-FOCUSING DISTANCE: 28.62 inches.
MAXIMUM MAGNIFICATION RATIO: 1:6.80.

*Tested measurement not available due to instrument limitation.

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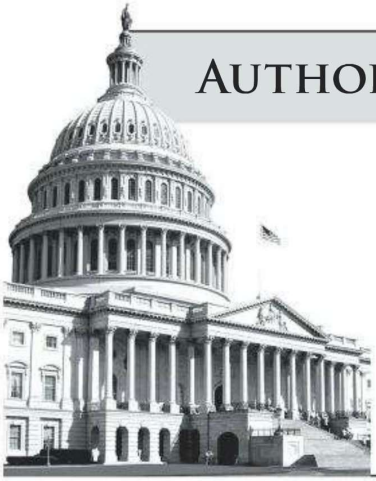
Coins enlarged to show detail.



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AMATEUR PRO

Lord Zoom

A SUPERSTAR GETS STABILIZED

FOR APS-C shooters who covet the fast, image-stabilized 70–210mm zooms for full-framers, Sigma provides the sole choice. This 50–150mm f/2.8 OS lens ($1,099, street) replaces a similar but nonstabilized lens in Sigma's catalog. Its EX designation points to a pro-quality optic, and the specs support that: Internally zooming and focusing, with six SLD glass elements for sharpness, it focuses quietly and includes a removable tripod collar, which the older 50–150mm lacked.

Scaling up to an equivalent 80–240 (Canon) or 75–225mm (Nikon), the lens is heavy and bulky. Despite covering a smaller image circle, it is the same size and weight as Sigma's full-frame 70–200mm f/2.8 OS zoom ($1,299, street). Surprising for a lens of this caliber, it has neither an O-ring on the mount to seal out moisture and dust nor a depth-of-field scale (the 70–200mm has two).

Both the focus and zoom rings turn smoothly, grip easily, and are quite large. We also like the sure and silent AF, with its adequate speed and manual-focus override capability.

Our optical bench tests found SQF numbers for sharpness and

CONTINUES ON PAGE 104

SIGMA 50–150MM F/2.8 EX APO DC OS HSM
WHAT'S HOT
Optically stabilized and fast.
WHAT'S NOT
Bulky and relatively expensive.
WHO IT'S FOR
APS-C shooters jonesing for pro-quality performance.

SPECIFICATIONS

50–150MM (51.33–145.72mm tested), f/2.8 (f/2.89 tested), 21 elements in 15 groups. Focus ring turns 130 degrees. Zoom ring turns 80 degrees. Focal length marked at 50-, 70-, 17-, 100-, and 150mm.
DIAGONAL VIEW ANGLE: 31–11 degrees.
WEIGHT: 3 lbs. **FILTER SIZE:** 77.
MOUNTS: Canon AF, Nikon AF, Sigma AF.
INCLUDED: Lenshood, case, tripod collar.
STREET PRICE: $1,099.
WEBSITE: sigmaphoto.com

TEST RESULTS

DISTORTION: At 50mm, 0.17% (Slight) barrel. At 100mm, 0.02% (Imperceptible) pincushion. At 150mm, 0.06% (Imperceptible) pincushion.
LIGHT FALLOFF: At 50mm, gone by f/3.5. At 100mm, none. At 150mm, gone by f/3.5.
CLOSE-FOCUSING DISTANCE: 27.33 inches.
MAXIMUM MAGNIFICATION RATIO: At 50mm, 1:10. At 100mm, 1:6.38. At 150mm, 1:5.31.
STABILIZATION: 2.5 stops.

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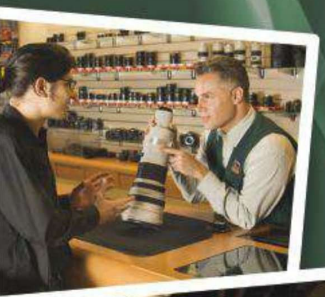

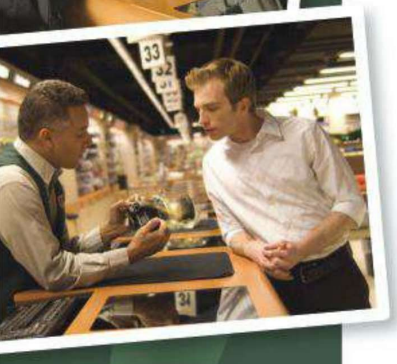

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#CAPSE110 Black, Blue, Green, Pink, Red, Silver*

16 Mega Pixels

Canon Powershot G12

- 2.8" Vari-Angle LCD • 1280 x 720p HD Video Capture • Stereo Sound for Video
- 5x Optical Zoom • 4x Digital Zoom
- 6.1-30.5mm f/2.8-4.5 (35mm equiv: 28-140mm) • SD/SDHC/SDXC Card Slot
- RAW File Mode • Dim.: 4.41 x 3 x 1.9"

*#CAPSG12**

10 Mega Pixels

Canon PowerShot G1 X

- 3.0" Vari-Angle LCD • Full 1080p HD Video • Optical Viewfinder
- 4x Optical Zoom • 4x Digital Zoom
- 15.1-60.4mm f/2.8-5.8 (35mm equiv: 28-112mm) • SD/SDHC/SDXC Card Slot
- Manual & Numerous Other Shooting Modes

#CAPSG1X

14 Mega Pixels

Nikon Coolpix AW100

- 3.0" LCD • 5x Optical Zoom
- 5-25mm f/3.9-4.8 (35mm equiv: 28-140mm) • SD/SDHC/SDXC Card Slot
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- Shockproof for Drops up to 5'
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#NICPAW100 Black, Blue, Orange*

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Panasonic Lumix DMC-ZS20

- 3.0" Smart Touch LCD Screen
- 1920 x 1080 Full HD Video Capture
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SONY CyberShot DSC-W610

- 2.7" LCD • 720p HD Video
- iAuto Mode • 4x Optical Zoom
- 4.7-18.8mm f/2.8-5.9 (35mm equiv: 26-105mm) • Face Priority Function
- MS Duo, SD/SDHC/SDXC Card Slot
- Sweep Panorama Mode Up to 360°

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14 Mega Pixels

MEMORY CARDS

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	125x	500x	700x	1000x	Std	Elite Pro 133x	Ultimate 266x	Ultimate 600x	400x	1000x	Ultra 30 MBs	Extreme 60 MBs	Extreme Pro 90 MBs	Extreme Pro 100 MBs
8GB	19.95	29.99	—	—	14.95	17.14	—	—	35.95	—	29.95	49.95	—	—
16GB	39.95	49.99	74.99	119.99	—	—	29.95	64.50	65.50	135.95	54.95	84.95	129.95	—
32GB	79.95	84.99	134.99	199.99	—	—	63.95	107.95	124.95	235.00	—	153.95	239.95	—
64GB	—	169.99	319.99	399.99	—	—	—	—	214.30	439.00	—	307.95	454.95	—
128GB	—	—	579.99	649.99	—	—	—	—	376.95	725.92	—	—	—	879.95
256GB	—	—	—	999.99	—	—	—	—	—	—	—	—	—	—

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	Mark II	Pro-HG HX
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4GB	18.99	—
8GB	—	29.95
16GB	—	59.95
32GB	—	105.95

SDXC-UHS-1 Extended Capacity

	Delkin	Kingston	Lexar		Sandisk			Panasonic
	Class 10 600x	Class 10 35 MBs	Class 10 400x	Class 10 600x	Class 10 30 MBs	Class 10 45 MBs	Class 10 90 MBs	Class 10 45 MBs
64GB	119.99	203.50	99.95	159.95	97.50	103.95	212.95	209.99
128GB	229.99	—	184.95	—	—	233.95	—	—

Note: Not all devices support SDXC cards

SDHC-UHS-1 Ultra High Speed

	Delkin	Kingston	Lexar		Sandisk		Panasonic		Sony
	Class 10 600x	Ultimate XX 35 MBs	Class 10 400x	Class 10 600x	Ultra 30 MBs	Extreme Pro 90 MBs	Gold 25 MBs	Pro Class 10	Pro Class 10
8GB	24.99	36.95	21.95	—	—	28.99	26.95	54.95	19.99
16GB	34.99	74.50	33.95	46.50	21.95	56.11	50.57	99.95	39.99
32GB	59.99	142.95	49.95	89.95	44.95	104.50	101.97	196.50	59.99

SD HC Secure Digital High Capacity

	Delkin		Kingston				Lexar		Sandisk				Sony		
	Pro Class 6	Pro Class 10	Standard Class 4	Standard Class 6	Ultimate X Class 10	Micro Class 4 Multi Kit	Std Class 4	Platinum II 100x	Std Class 4	Ultra	Extreme Class 10	Micro Class 4	Standard Class 4	Standard Class 10	Micro Class 4
4GB	—	7.95	—	—	—	5.50	6.95	7.95	7.95	8.50	12.95	6.95	6.95	—	7.90
8GB	12.95	10.04	6.29	16.95	15.95	6.95	9.95	8.95	9.95	12.99	16.95	9.95	11.99	—	10.49
16GB	—	14.95	12.95	—	19.95	12.95	14.95	16.95	13.23	—	28.50	13.70	17.99	—	—
32GB	—	29.95	27.95	—	49.95	28.50	27.95	29.95	28.94	—	59.50	32.95	39.95	39.99	—

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Model	Included Head	Load Capacity	Max. Height	Folded	Weight	SKU #	Price
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AT-3410	BA-00T	6.6 lb	59.4"	16.5"	3.4 lb	#OBAT3410BA00	$224.95
AT-3420	BA-0T	11 lb	62.6"	17.7"	4.2 lb	#OBAT3420BA0T	$259.95
6x Carbon Fiber Series with Head							
CT-3400	BB-0T	12.4 lb	56.7"	15"	3 lb	#OBCT3400BB0T	$349.95
CT-3410	BB-0T	16.8 lb	59.4"	16.5"	3 lb	#OBCT3410BB0T	$399.95
CT-3420	BB-1T	22 lb	62.8"	17.7"	4 lb	#OBCT3420BB1T	$449.95
CT-3500	BB-0T	12.4 lb	53.3"	12.8"	2.5 lb	#OBCT3500BB0T	$349.95
CT-3510	BB-0T	16.8 lb	60.6"	15.5"	3.2 lb	#OBCT3510BB0T	$399.95
CT-3520	BB-1T	22 lb	64.8"	16.5"	4 lb	#OBCT3520BB1T	$469.95

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24 Mega Pixels

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24-70/2.8 Carl Zeiss (77ø)	1,999.99
70-200/2.8 G APO (77ø)	1,999.99
70-300/4.5-5.6 G (62ø)	999.99
75-300/4.5-5.6 (55ø)	249.99
1.4x Teleconverter	549.99
2x Teleconverter	549.99

OLYMPUS 50mm f/2 Macro ED Zuiko Digital Lens

- *Designed exclusively for Digital SLRs*
- Ideal for macro photography and also as a portrait lens
- Magnification 1:2
- ED glass element
- Min. focus: 9.45"
- 52mm filter diameter
- Weight: 10.6 oz

PENTAX 18-135mm f/3.5-5.6 ED AL (IF) DC WR Digital Lens

- *Designed exclusively for Digital SLRs*
- SP Coating Repels Dust, Water, & Grease
- Weather resistant
- Quick-Shift Focus System
- Min. focus: 1.3'
- 62mm filter diameter
- Weight: 14.3 oz

SONY HVL-F58AM Shoe-Mount Digital Flash

- Zoom Head (24-105mm)
- Bounce & Swivel Head
- Guide No. 190'
- TTL Dedication
- Vari-Power
- High-Speed Sync
- Auto WB Adjustment
- Wireless Ratio Control
- Weight: 15.6 oz

SONY 16-80mm f/3.5-4.5 Carl Zeiss T* DT Digital Lens

- *Designed exclusively for Digital SLRs*
- Ideal for snapshots, portraits, interiors, or outdoor scenery
- 35mm equiv: 24-120mm
- Min. focus: 13.8"
- 62mm filter diameter
- Weight: 15.5 oz

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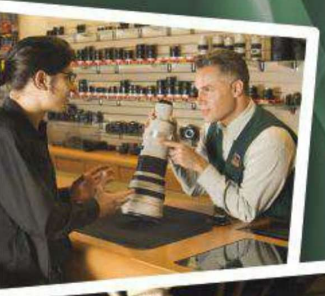

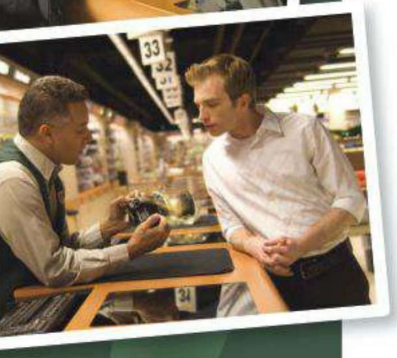

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Canon Digital Rebel T3 DSLR

- 2.7" Clear View LCD with Live View Function
- Uses Canon EF Lenses (1.6x factor)
- SDHC/SDXC Card Slot
- 3 fps Continuous Shooting
- ISO 100-6400
- Full HD Movie Mode
- RAW + JPEG Files
- Basic + Function / Creative Auto
- 63 Zone Dual-Layer System/9 Point AF

Expires 6-30-12

*Kit with 18-55mm IS..... #CAEDRT3K ..... **$50 Rebate!***

12 Mega Pixels

Canon Digital Rebel T3i DSLR

- 3" Clear View Vari-Angle LCD
- Uses Canon EF Lenses (1.6x factor)
- SDHC/SDXC Card Slot
- 3.7 fps Continuous Shooting
- ISO 100-6400
- RAW + JPEG Files
- Full HD Movie Mode with Manual Exposure
- 63 Zone Dual-Layer System/9 Point AF

Expires 6-30-12

Body Only..... #CAEDRT3I ..... —
*Kit with 18-55mm IS..... #CAEDRT3IK ..... **$50 Rebate!***

18 Mega Pixels

Canon EOS-60D DSLR

- 1920 x 1080 HD Video Capture
- DIGIC 4 Image Processor
- SD/SDHC/SDXC Card Slot
- Works with all Canon EF & EF-S Lenses • Vari-Angle Clear View 3.0" Flip-Out LCD
- HDMI Output to HDTV
- 5.3 fps Continuous Shooting
- ISO 6400 - Expandable to 12800

Expires 6-30-12

*Body Only..... #CAE60D ..... **$100 Rebate!***
*Kit with 18-135mm IS..... #CAE60D18135 ..... **$100 Rebate!***
*Kit with 18-200mm IS ..... #CAE60D18200 ..... **$100 Rebate!***

18 Mega Pixels

Canon EOS-5D Mark III DSLR

- 3.2" Clear View High Resolution LCD
- DIGIC 5+ Image Processor
- 61-Point High Density AF
- Uses Canon EF Lenses
- Dual CF, SD Card Slots
- Extended ISO Range (50-102400)
- Durable Magnesium-Alloy Construction
- Full HD 1080/30p and 720/60p Formats
- Built-In HDR and Multiple Exposure Modes

*Body Only..... #CAE5D3**
Kit with 24-105mm L IS..... #CAE5D324105
EOS-5D Mark II *Body Only. #CAE5D2 .....* ***In Stock***

22 Mega Pixels

Canon EOS-7D DSLR

- Record HD Video • 3" LCD
- Uses Canon EF Lenses
- CF, MD Card Slot
- Dust and Weather Resistant
- Selectable Video Exposure and Frame Rates
- ISO 100-6400 (expandable to 12800) • 8 fps Burst Mode
- 19-Point, All Cross-Type AF System

Expires 6-30-12

*Body Only..... #CAE7D ..... **$150 Rebate!***
*Kit with 18-135mm IS..... #CAE7D18135 ..... **$150 Rebate!***
*Kit with 28-135mm IS..... #CAE7D28135 ..... **$150 Rebate!***

18 Mega Pixels

Canon EOS-1Dx DSLR

- Dual DIGIC 5+ Image Processors
- Magnesium Alloy Body
- Eye-Level Pentaprism Viewfinder
- 3.2" LCD Monitor
- Uses Canon EF Lenses
- Dual CF card slots
- 1920 x 1080 HD Video Capture
- Live View Still and Video Recording
- 61-Point High Density Auto Focus

*Body Only..... #CAE1DX**

18 Mega Pixels

Canon SLR Lenses and Flashes

EOS Flash System (USA)

270EX		430EX II	***$20 Rebate****
270EX II	***$10 Rebate****	580EX II	***$30 Rebate****
320EX	***$25 Rebate****	600EX-RT	***$30 Rebate****
MR-14EX Ringlight	***$30 Rebate****		
MT-24EX Twin Flash	***$50 Rebate****		

EF-S Lenses for Digital Only (USA)

(Not compatible with full frame cameras)

60/2.8 USM Macro (52ø)	***$40 Rebate****
10-22/3.5-4.5 USM (77ø)	***$60 Rebate****
15-85/3.5-5.6 IS USM (72ø)	***$65 Rebate****
17-55/2.8 IS USM (67ø)	***$80 Rebate****
17-85/4-5.6 IS USM (67ø)	
18-55/3.5-5.6 IS (58ø)	
18-135/3.5-5.6 IS (67ø)	
18-200/3.5-5.6 IS (72ø)	
55-250/4.0-5.6 IS USM (58ø)	

EF Lenses (USA)

24/2.8 (58ø)		28/2.8 IS USM (58ø)	
24/2.8 IS USM (58ø)		35/2 (52ø)	
28/2.8 (52ø)		50/1.8 II (52ø)	
28/1.8 USM (58ø)	***$40 Rebate****		
20/2.8 USM (72ø)	***$40 Rebate****		
50/2.5 Macro (52ø)	***$20 Rebate****		
50/1.4 USM (58ø)	***$30 Rebate****		
MP-E 65/2.8 1x-5x Macro (58ø)	***$70 Rebate****		
85/1.8 USM (58ø)	***$30 Rebate****		
100/2 USM (58ø)	***$35 Rebate****		

* Double Rebates up to $550

with purchase of lens or speedlight together with a qualifying DSLR camera body/kit.

- EOS-60D Body
- EOS-60D Kit with 18-135mm IS Lens
- EOS-60D Kit with 18-200mm IS Lens
- EOS-7D Body
- EOS-7D Kit with 18-135mm IS Lens
- EOS-7D Kit with 28-135mm IS Lens
- EOS-5D Mark II or III Body
- EOS-5D Mark II or III Kit with 24-105mm IS Lens

Expires 6-30-12

EF Lenses (USA)

100/2.8 USM Macro (58ø)	***$40 Rebate****
135/2.8 (52ø)	
28-135/3.5-5.6 IS USM (72ø)	
70-300/4-5.6 IS USM (58ø)	
70-300/4.5-5.6 DO IS USM (58ø)	***$90 Rebate****
75-300/4.0-5.6 III (58ø)	
75-300/4.0-5.6 III USM (58ø)	

TS-E MF Lenses (USA)

17/4.0 "L"	***$170 Rebate****
24/3.5 "L" II	***$150 Rebate****
45/2.8	***$100 Rebate****
90/2.8	***$100 Rebate****

EF "L" Lenses (USA)

14/2.8 USM II	***$160 Rebate****
24/1.4 II (77ø)	***$120 Rebate****
35/1.4 USM (72ø)	***$100 Rebate****
50/1.2 USM (72ø)	***$120 Rebate****
85/1.2 USM II (72ø)	***$150 Rebate****
100/2.8 IS USM Macro (67ø)	***$70 Rebate****
135/2.0 USM (72ø)	***$75 Rebate****
180/3.5 USM Macro (72ø)	***$110 Rebate****
200/2.8 USM II (72ø)	
200/2.0 IS USM (52ø)	

EF "L" Lenses (USA)

300/4.0 IS USM (77ø)	***$90 Rebate****
300/2.8 IS USM II (52ø rear)	
400/5.6 USM (77ø)	
400/2.8 IS II (52ø rear)	
500/4 IS USM II (52ø rear)	
600/4.0 IS II (52ø rear)	
8-15/4.0 Fish-eye USM	***$100 Rebate****
16-35/2.8 USM II (82ø)	***$110 Rebate****
17-40/4.0 USM (77ø)	***$60 Rebate****
24-70/2.8 USM (77ø)	
24-70/2.8 II USM (82ø)	
24-105/4 IS USM (77ø)	
28-300/3.5-5.6 IS USM (77ø)	
70-200/4.0 USM (67ø)	
70-200/4.0 IS USM (77ø)	***$100 Rebate****
70-200/2.8 USM (77ø)	***$100 Rebate****
70-200/2.8 IS II USM (77ø)	***$200 Rebate****
70-300/4.0-5.6 IS USM (67ø)	***$100 Rebate****
100-400/4.5-5.6 IS USM (77ø)	***$110 Rebate****
1.4x II Teleconverter	
1.4x III Teleconverter	***$35 Rebate****
2x III Teleconverter	***$35 Rebate****

Canon 600 EX-RT Shoe-Mount Flash — $30 REBATE!*

- Dust and water resistance
- Guide No. 197'
- Wireless Radio Multiple Flash System
- Bounce and Swivel Head
- Zoom Head (20-200mm)
- 18 Custom Functions
- Weight: 15 oz

Canon 10-22mm f/3.5-4.5 EF-S USM Digital Lens — $60 REBATE!*

- *Designed exclusively for Digital SLRs*
- 35mm equivalent: 16-35mm
- Min. Focus: 9.5"
- 3 aspherical lens elements
- 3.5-27 f/Stop Range
- 77mm filter diameter
- Weight: 13.6 oz

Canon 24-70mm f/2.8 EF "L" USM Zoom Lens

- Sealed and gasketed against dust and moisture
- Internal Focusing
- UD Element
- Two Aspherical Elements
- 2.8-22 f/Stop Range
- Focus 1.25' to Infinity
- 77mm filter diameter
- Weight 33.6 oz

Canon 70-200mm f/2.8 EF "L" IS II USM Telephoto-Zoom Lens — $200 REBATE!*

- Improved Optical Image Stabilization provides up to 4 stops correction
- Min. Focus: 3.9'
- Dust & moisture resistant
- 77mm filter diameter
- Weight: 52.56 oz

Nikon 1 J1 Mirrorless Digital Camera

- EXPEED 3 Dual Image Processor
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- SD/SDHC/SDXC Card Slot
- Full HD (1080p) Movie Record Mode
- Motion Snapshot 1-Touch Photo Animation
- 10 fps Continuous Shooting in AF Mode
- Available in Black, Red, Silver or White
- Nikon Inc. limited warranty included

** Available in Black only

*Kit with 10-30mm VR**.....#NI1J1*.....**646.95**
Kit with 10mm & 10-30mm VR...#NI1J110.....**896.95**
Kit with 10-30 & 30-110mm VR..#NI1J11030.....**896.95**

10 Mega Pixels

Nikon D3200 DSLR

- EXPEED III Image Processor
- HD 1080p Video
- 3" LCD • Live View
- Uses Nikon AF Lenses (1.5x factor)
- SD/SDHC/SDXC Card Slot
- 11-point Autofocus
- Up To ISO 12800
- Nikon Inc. limited warranty included

D3200 Kit Black *w/18-55mm VR ...#NID32001855*.....**699.95**
D3200 Kit Red *w/18-55mm VR.....#NID32001855R*.....**699.95**
D3100 Kit *with 18-55mm VR.....#NID31001855*.....**646.95**

24 Mega Pixels

Nikon D5100 DSLR

- 1080p HD Movies with Full Time AF
- Uses Nikon AF Lenses (1.5x factor)
- 3.0" Vari-angle LCD
- SD/SDHC Card Slot
- ISO Sensitivity 100-6400
- In-Camera Special Effects Mode
- In-Camera HDR (High Dynamic Range)
- Fast 11-Point Autofocus System
- Nikon Inc. limited warranty included

Body Only.....#NID5100.....**746.95**
Kit with 18-55mm VR.....*#NID51001855*.....**846.95**

16 Mega Pixels

Nikon D7000 DSLR

- EXPEED 2 Image Processor
- 1080p HD Video Capture
- RAW + JPEG Still Image Capture
- Accepts Nikon AF Lenses (1.5x factor) • 3" LCD Monitor
- Twin SD/SDHC/SDXC Card Slots
- 39-point AF System
- RGB 3D Matrix Metering System
- i-TTL Flash + Speedlight Compatibility
- Nikon Inc. limited warranty included

Body Only.....#NID7000.....**1,199.95**

16 Mega Pixels

Nikon D800 DSLR

- 35.9x24mm CMOS FX Format Sensor
- 3.2" LCD Monitor
- Nikon F Mount Lens Mount
- CF & SD Dual Card Slots
- Optical Low-Pass Filter
- Eye-Level Pentaprism Viewfinder
- 1920 x 1080/30/25/24p HD Video Capture • Matrix/Center-Weighted/Spot Metering
- Built-In Flash + i-TTL Flash Control
- Nikon Inc. limited warranty included

Body Only.....#NID800..... **2,999.95**

36 Mega Pixels

Nikon D4 DSLR

- RAW, TIFF, JPEG, RAW+JPEG Files
- FX-format (full-frame) CMOS Sensor
- 1080p HD Broadcast Quality Video
- EXPEED3 Image Processor
- 3.2" LCD Screen with Live View
- Compatible with Most Nikkor Optics
- Matrix, Center-Weighted, Spot Metering • 100-12800 ISO
- CF Type 1 & XQD Compatible
- Nikon Inc. limited warranty included

Body Only.....#NID4.....**5,999.95**

16 Mega Pixels

Nikon SLR Lenses and Flashes

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AF Flashes

SB-400
SB-700.....**326.95**
SB-910.....**546.95**
R1 Wireless Twin Flash
R1C1 Wireless Twin Flash System

DX ED-IF Lenses for Digital Only

10.5/2.8 Fish-Eye
35/1.8 G AF-S (52ø).....**196.95**
40/2.8 G AF-S Micro (52ø).....**276.95**
85/3.5 G ED VR Micro (52ø)
10-24/3.5-4.5 G AF-S (77ø)
12-24/4 G AF-S (77ø)
16-85/3.5-5.6 G AF-S VR (67ø)
17-55/2.8 G AF-S (77ø)
18-55/3.5-5.6 G AF-S II (52ø)
18-55/3.5-5.6 G AF-S VR (52ø).....**196.95**
18-105/3.5-5.6 G AF-S VR (67ø).....**396.95**
18-200/3.5-5.6 G AF-S VR II (72ø).....**846.95**
55-200/4-5.6 G AF-S (52ø)
55-200/4-5.6 G AF-S VR (52ø).....**246.95**
55-300/4.5-5.6 G AF-S VR (58ø).....**396.95**

D-Type AF Lenses

14/2.8 D ED
16/2.8 D (39ø) with Hood
20/2.8 D (62ø)
24/2.8 D (52ø)
24/1.4 G AF-S ED (77ø)
24/3.5 D ED PC-E (77ø)
28/1.8 G AF-S (67ø).....**699.95**
28/2.8 D (52ø)
35/2.0 D (52ø)
35/1.4 G AF-S ED (67ø)
45/2.8 D ED PC-E Micro (77ø)
50/1.8 D (52ø)
50/1.8 G AF-S (58ø).....**216.95**
50/1.4 D (52ø)
50/1.4 G AF-S (58ø)
60/2.8 D Micro (62ø) (1:1)
60/2.8 G AF-S ED Micro (62ø)
85/1.8 D (62ø) with Hood
85/1.4 D IF (77ø)
85/1.4 G AF-S (77ø)
85/1.8 G AF-S (67ø).....**499.95**
85/2.8 PC-E Micro (77ø)
105/2.8 G AF-S ED-IF VR Micro (62ø)
105/2.0 DC D with Hood (72ø)
180/2.8 D ED-IF (72ø)

D-Type AF Lenses

200/4 D ED-IF Micro with Case (62ø)
200/2 G AF-S ED-IF VR II (52ø)
300/4.0 D AF-S ED-IF (77ø)
300/2.8 G AF-S VR (52ø-R)
400/2.8 G AF-S VR ED (52ø)
500/4.0 G AF-S VR ED (52ø)
600/4.0 G AF-S VR ED (52ø)
14-24/2.8 G AF-S ED-IF.....**1,996.95**
16-35/4.0 G AF-S ED VR (77ø)
17-35/2.8 D AF-S ED-IF (77ø)
24-70/2.8 G AF-S ED-IF (77ø).....**1,886.95**
24-85/2.8-4.0 D IF (72ø)
24-120/4.0 G AF-S ED VR (77ø).....**1,296.95**
28-300/3.5-5.6 G AF-S ED VR (77ø)
70-200/2.8 G AF-S ED-IF VR II (77ø).....**2,396.95**
70-300/4.0-5.6 G (62ø)
70-300/4.5-5.6 G-AFS VR (67ø).....**586.95**
80-200/2.8 D with Collar (77ø)
80-400/4.5-5.6 D VR (77ø)
200-400/4 G AF-S ED VR II (52ø)
TC-14E II (1.4x) Teleconverter
TC-17E II (1.7x) Teleconverter
TC-20E III (2x) Teleconverter

Nikon 24-70mm f/2.8 G AF-S ED-IF Zoom Lens

- Optimized for edge-to-edge sharpness on both the Nikon FX (full-frame) and DX-format image sensors
- Rugged construction, dust and moisture resistance
- Minimum focus 1.2'
- 77mm filter diameter
- Weight 32 oz

Nikon 18-200/3.5-5.6 DX G VR II AF-S ED-IF Digital Lens

- *Designed exclusively for Digital SLRs*
- 35mm equiv. 27-300mm
- **VR II** Vibration Reduction
- SWM (Silent Wave Motor)
- 3.5-22 f/Stop Range
- Focus 1.6' to Infinity
- 72mm filter diameter
- Weight 19.8 oz

Nikon 70-200/2.8 G AF-S ED-IF VR II Telephoto-Zoom Lens

- **VR II** Vibration Reduction
- 3.5-22 f/Stop Range
- SWM (Silent Wave Motor)
- Close Focusing to 4.6'
- 77mm filter diameter
- Weight 3.2 lbs

Nikon SB-910 Speedlight i-TTL Shoe Mount Flash

- Tungsten & Fluorescent Filters Included
- Guide No. 111.5'
- Simplified Graphic User Interface (GUI)
- Bounce & Swivel Head
- Zoom Head (17-200mm)
- Wireless Controller
- Weight 14.8 oz

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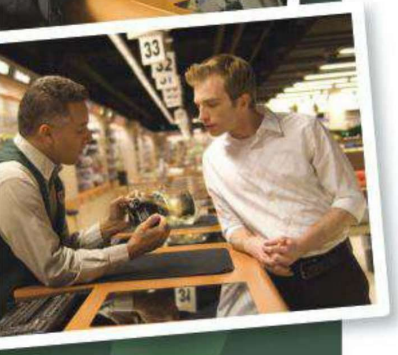

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		SKU #	Available for	Rebate	Price
Di-II	60/2.0 LD IF Macro (55ø)	#TA602DI*	C, N, SM	$100	424.00**
Di	90/2.8 Macro (55ø)	#TA9028M*	C, N, P, SM	$50	449.00**
Di	180/3.5 LD IF Macro (72ø)	#TA18035*	C, N, SM	$50	689.00**
Di-II	10-24/3.5-4.5 (77ø)	#TA102435*	C, N, P, SM	$50	449.00**
Di-II	17-50/2.8 XR LD IF Aspherical (67ø)	#TA175028*	C, N, P, SM	$25	474.00**
Di-II	17-50/2.8 XR VC LD IF Asph. (67ø)	#TA175028*Q	C, N	$50	599.00**
Di-II	18-200/3.5-6.3 (62ø)	#TA1820035*	C, N, P, SM	$50	249.00**
Di-III	18-200/3.5-6.3 VC (62ø) Black or Silver	#TA1820035S*	SE	—	739.00
Di-II	18-270/3.5-6.3 VC (72ø)	#TA1827035*	N	—	CALL
Di-II	18-270/3.5-6.3 VC PZD (62ø)	#TA18270*	C, N, SM	$100	549.00**
Di	24-70/2.8 VC USD (82ø)	#TA247028*	C, N, SM	—	1,299.00
Di	28-75/2.8 XR (67ø)	#TA287528*	C, N, P, SM	$25	474.00**
Di	28-300/3.5-6.3 XR LD (62ø)	#TA2830035XD*	C, P, SM	—	419.00
Di	28-300/3.5-6.3 XR VC (62ø)	#TA2830035*	C, N	—	629.00
Di	70-200/2.8 LD IF Macro (77ø)	#TA7020028M*	C, N, P, SM	—	769.00
Di	70-300/4.0-5.6 VC USD (62ø)	#TA70300*	C, N, SM	$100	349.00**
Di	75-300/4.0-5.6 LD (62ø)	#TA753004*	C, N, SM	—	164.00
Di	200-500/5-6.3 LD IF (86Cø)	#TA2005005*	C, N, SM	—	949.00
	1.4x SP AF Pro Teleconverter	#TA14XP*	C, N	—	224.00
	2x SP AF Pro Teleconverter	#TA2XP*	C, N	—	254.00

Tokina AF LENSES

DX – for Digital SLRs Only **FX** – Designed for full frame DSLRs *** Price After Rebate* *Exp. 6-30-12*

** Also Available for Sony Alpha DSLR

		Canon EOS	Nikon AF	Rebate	Price
FX	100/2.8 Pro D Macro (52ø)	#TO10028PCAF	#TO10028PNAF	—	489.00
DX	10-17/3.5-4.5 ATX Fisheye	#TO1017735CAF	#TO1017735NAF	—	669.00
DX	11-16/2.8 Pro (77ø) **	#TO111628PDXC	#TO111628PDXN	$40	659.00**
DX	12-24/4.0 Pro II (77ø)	#TO12244DXC	#TO12244DXN	—	599.00
FX	16-28/2.8 Pro	#TO1628FXC	#TO1628FXN	$50	799.00**
FX	17-35/4 Pro (82ø)	#TO1735F4FXC	#TO1735F4FXN	$40	659.00**

FLASHES

Metz

28 CS-2 Digital Slave Shoe Mount Flash	139.99
44 AF-1 Digital Shoe Mount Flash	199.99
50 AF-1 TTL Digital Shoe Mount Flash	249.99
58 AF-2 TTL Digital Shoe Mount Flash	399.99
45 CL-4 TTL Digital Handle Mount Flash	519.99
45 CL-4 TTL Digital Handle Mount Flash Kit	699.99
76 MZ-5 TTL Digital Handle Mount Flash	1,039.99

Quantum

Q-flash TRIO	875.00
Q-flash T5D-R	706.00
Q-flash T5D-R with Turbo SC Battery & Charger	1,172.00
Q-flash T5D-R with Turbo 3 Battery Kit	1,303.50

Batteries

Battery 1	224.00	Turbo Blade	466.00
Turbo SC	466.00	Turbo 3	624.00

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PF20XD Digital Slave Shoe Mount Flash	44.95
RD-2000 Shoe Mount Flash	64.95
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PZ-4000 AF TTL Shoe Mount f/Canon, Nikon	74.95
PZ-40x II AF TTL Shoe Mount f/Nikon (Silver)	69.95
PZ-42x AF TTL Shoe Mount for Canon, Nikon	145.95
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H – HSM Model with Canon, Nikon, Sigma
R – Rear Slip-in Gelatin Filter Slot

		Canon	Nikon	Pentax	Sigma	Sony	Rebate	Price
DC	4.5mm f/2.8 EX Circular Fisheye HSM R	#SI4528EXDCC	#SI4528EXDCN	#SI4528EXDCP	#SI4528EXDCSI	#SI4528EXDSO	—	899.00
DG	8/3.5 EX Circular Fisheye R	#SI835CA	#SI835NA	—	#SI835SI	—	—	899.00
DC	10mm f/2.8 EX Fisheye HSM R	#SI1028EXDCC	#SI1028EXDCN	#SI1028EXDCP	#SI1028EXDCSI	#SI1028EXDCSO	—	649.00
DG	15/2.8 EX Diagonal Fisheye R	#SI1528DGCAF	#SI1528DGNAF	#SI1528DGPAF	#SI1528DGSA	#SI1528DGMAF	—	609.00
DG	20/1.8 EX DF RF Aspherical (82ø)	#SI2018CAF	#SI2018NAF	#SI2018PAF	#SI2018SA	#SI2018MAF	—	629.00
DG	24/1.8 EX DF Aspherical Macro (77ø)	#SI2418MCAF	#SI2418MNAF	#SI2418MPAF	#SI2418MSA	#SI2418MMAF	—	549.00
DG	28/1.8 EX DF Aspherical Macro (77ø)	#SI2818MCAF	#SI2818MNAF	#SI2818MPAF	#SI2818MSA	#SI2818MMAF	—	449.00
DC	30mm f/1.4 EX HSM (62ø)	#SI3014DCCAF	#SI3014DCNAF	#SI3014DCPAF	#SI3014DCSA	#SI3014DCMAF	—	489.00
DG	50mm f/1.4 EX (77ø) H	#SI5014C	#SI5014N	#SI5014PE	#SI5014SI	#SI5014SOM	$50	449.00**
DG	50/2.8 EX Macro (55ø)	#SI5028MDGCAF	#SI5028MDGNAF	#SI5028MDGPAF	#SI5028MDGSA	#SI5028MDGMAF	—	369.00
DG	70/2.8 EX Macro (62ø)	#SI7028MDGCA	#SI7028MDGNA	#SI7028MDGPA	#SI7028MDGSA	#SI7028MDGSAQ	—	499.00
DG	85/1.4 EX HSM (77ø)	#SI8514C	#SI8514N	#SI8514P	#SI8514SI	#SI8514S	—	969.00
DG	105/2.8 EX Macro OS HSM (62ø)	#SI10528MDGCE	#SI10528MDGNQ	—	#SI10528MDGS	#SI10528MDGSM	$200	769.00**
DG	150/2.8 EX APO Macro OS HSM (72ø)	#SI15028AMOC	#SI15028AMON	#SI15028AMOP	#SI15028AMSI	#SI15028AMOS	—	1,099.00
DG	300/2.8 APO EX HSM	#SI30028DGCAF	#SI30028DGNAF	#SI30028DGPAF	#SI30028DGSA	#SI30028DGMAF	—	3,399.00
DG	500/4.5 APO EX HSM	#SI50045DGCAF	#SI50045DGNAF	#SI50045DGPAF	#SI50045DGSA	#SI50045DGMAF	—	4,999.00
DC	8-16/4.5-5.6 HSM	#SI8164556CA	#SI8164556NI	#SI8164556PE	#SI8164556SI	#SI8164556SO	—	699.00
DC	10-20/4-5.6 EX HSM (77ø)	#SI102045DCAF	#SI102045DNAF	#SI102045DPAF	#SI102045DSA	#SI102045DMAF	—	479.00
DC	10-20/3.5 EX HSM (82ø)	#SI102035C	#SI102035SN	#SI102035P	#SI102035SG	#SI102035S	$50	599.00**
DG	12-24/4.5-5.6 EX Aspherical HSM II	#SI122445C	#SI122445N	#SI122445P	#SI122445SI	#SI122445S	$75	874.00**
DC	17-50/2.8 EX OS HSM (77ø)	#SI175028CA	#SI175028NI	#SI175028PE	#SI175028SI	#SI175028SO	—	669.00
DC	17-70/2.8-4.0 OS Macro HSM (72ø)	#SI177028DCC	#SI177028DCNQ	#SI177028DCP	#SI177028DCSI	#SI177028DCSM	$50	419.00**
DC	18-50/2.8-4.5 OS HSM (67ø)	#SI185028DOC	#SI185028DON	#SI185028DOP	#SI185028DOSG	#SI185028DOS	—	199.00
DC	18-125/3.8-5.6 OS (Optical Stabilizer) (67ø) H	#SI18125350SC	#SI18125350SN	#SI18125350SP	#SI18125350SI	#SI18125350SS	—	339.00
DC	18-200/3.5-6.3 OS II HSM (72ø)	#SI1820035CQ	#SI1820035NQ	—	#SI1820035SAQ	#SI1820035SQ	$50	449.00**
DC	18-250/3.5-6.3 OS HSM (72ø)	#SI1825035C	#SI1825035N	#SI1825035CP	#SI1825035S	#SI1825035CSN	—	479.00
DG	24-70/2.8 EX IF HSM (82ø)	#SI247028C	#SI247028NF	#SI247028PS	#SI247028S	#SI247028SM	$75	824.00**
DC	50-150/2.8 EX APO OS HSM (77ø)	#SI5015028CA	#SI5015028NA	—	#SI5015028SAF	—	—	1,099.00
DC	50-200/4-5.6 OS HSM (55ø)	#SI5020045DOC	#SI5020045DON	#SI5020045DOP	#SI5020045DSG	#SI5020045DOS	—	159.00
DG	50-500/4.5-6.3 APO OS HSM (95ø)	#SI505004563C	#SI505004563N	#SI505004563P	#SI505004563SA	#SI505004563SM	—	1,659.00
DG	70-200/2.8 EX APO OS HSM (77ø)	#SI7020028CQ	#SI7020028NI	#SI7020028P	SI7020028SIQ	#SI7020028SOQ	$100	1,299.00**
DG	70-300/4-5.6 DL Macro Super II (58ø)	#SI703004SCAF	#SI70300456N	#SI703004PAF	#SI703004SA	#SI703004MAF	—	169.00
DG	70-300/4-5.6 APO Macro Super II (58ø)	#SI703004DGCA	#SI70300456AN	#SI703004DGPA	#SI703004DGSA	#SI703004DGMA	—	239.00
DG	70-300/4-5.6 OS (62ø)	#SI7030045C	#SI7030045N	#SI7030045P	#SI7030045S	#SI7030045SM	$50	309.00**
DG	120-300/2.8 EX APO OS HSM (105ø)	#SI12030028C	#SI12030028N	#SI12030028P	—	#SI12030028S	—	3,199.00
DG	120-400/4.5-5.6 APO OS HSM (77ø Rear)	#SI120400C	#SI120400N	#SI120400PAF	#SI120400S	—	$100	899.00**
DG	150-500/5-6.3 APO OS HSM	#SI150500C	#SI150500N	#SI150500P	#SI150500S	#SI150500M	$100	969.00**
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DG	2x EX APO Tele-Converter	#SI2XDGCAF	#SI2XDGNAF	#SI2XDGPAF	#SI2XDGSA	#SI2XDGMAF	—	299.00
DG	EF-610 ST	#SIEF610STC	#SIEF610STN	#SIEF610STP	#SIEF610STSI	#SIEF610STS	—	165.00
DG	EF-610 Super Flash	#SIEF610C	#SIEF610N	#SIEF610P	#SIEF610SI	#SIEF610S	—	255.00
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- *Designed exclusively for Digital SLRs*
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UV, Skylight (1B) Super HMC	35.85	44.85	55.35	65.85	74.85
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Close Up Set (+1, +2, +4)	50.85	64.35	77.85	95.85	104.85
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Circular Polarizer	63.00	65.00	81.50	93.50	105.00
Circular Polarizer Multi-Coated	90.00	93.50	117.00	134.50	160.50
81A, B, KR3, 6, 12, 15	26.50	26.50	36.00	42.00	49.00
KB1.5, 3, 6, 12, 15, 20	28.50	28.50	35.00	40.50	47.50
#021, 023, 041, 060, 061, 090	24.50	24.50	36.00	42.00	49.00
Graduated (N.D. & Colors)	46.50	47.50	58.50	68.00	82.50
ND .9, 1.8, 3.0, 4.0, 6.0	42.00	42.00	67.50	84.00	94.50
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ND 0.6	64.95	74.95	99.95	109.95	129.95
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The UNEDITED WASHINGTON POST cancer article describes "the curative power etc" experienced by our patents as far back as 1/27/92! Edited because Oncologists know that ordinary distillers/fi lters SPREAD the disease markers of former users of your tap water and sellers DON'T WANT YOU TO KNOW THAT!! That's why the Associated Press called the inventor: Standard Water Tests don't reveal the 57 drugs found in municipal tap water (AP 3/10/08)!! When people fl ush their toilets, the drugs and disease markers expressed in a Blood Test go into the aquifer and end up in spring water, bottled water, and well water...fi nally fi nding their way into your municipal water system (AP 3/10/08)!! ONLY High Intensity Ultra-Violet Modular Frequency and HEAT 100's of times a gallon (NOT ONCE!!) CAN DESTROY THEM WHILE INCREASING Blood Flow (94% water) to the extremities measured by Doppler Ultrasound. UCLA M.D. years ago: "Nobody can argue with measurable Blood Flow! Nothing is even close to your water!!"

As two time Nobel Prize winner Otto Warburg, MD teaches, **"Cancer cells can't survive in high blood oxygen!" That's the key!! We discovered how to get more oxygen into the blood stream by increasing the solubility of water. Plus, the blood flow results can be measured non-invasively on the skin! That's why the regulators won't allow "Alternative Cancer Cures"!** In addition, cancer can go into remission spontaneously!

This is how this was discovered: An M.D. that taught at the UCLA Medical School used our water to perform non-invasive tests that we can use because the results are measured on the SKIN (using Doppler Ultrasound) to see which water produced the best Blood Flow to the extremities (Blood is 94% water): "Nothing is even close to your water in getting blood to the extremities!!" This is because our water has higher SOLUBILITY (that a child can measure) than ANY other water!! When you increase the Solubility of water, blood fl ow increases and your Blood can absorb more oxygen coming into your LUNGS (simply oxygenating water doesn't get oxygen into the blood stream)! Regulators also allowed the product "Put It Where It Hurts" because in similar fashion, the results can be measured non-invasively on the SKIN!

I am an 82 year old Engineer and Inventor. When I was in Engineering School text book science said you couldn't increase the Solubility of water (Hydrogen Bond Angle) and some people still believe that. However, The Washington Times with a 600 million investment in Washington, DC has been a major infl uence and the Advertising Manager called me years ago to say they had at least 50 phone calls ranging from the Los Alamos Nuclear Lab to Johns Hopkins Hospital: "They all have your machines!" Los Alamos Scientists: "We were wrong! He is right!"

If you look at our website, the Ad Manager has a contact number to verify all these reports including his own great success story. With a full page ad in The Washington Times every week for 15 years, he knows more about the results better than anyone including reports from the top three Oncologists in the United States!

Recently, since it's such a touchy subject, I was startled by the cancer comments from a caller so I said: "How would you know that?" He said he was an Oncologist at Sloan for 30 years and since he retired without access to our machine, he wanted our E5 Machine! He is just one of the retired Oncologists from Sloan that have bought our machines and mentioned that they all knew about Otto Warburg M.D. in Medical School and they wondered how many years it would take for somebody to fi gure this out! That made me realize that the Regulators obtained the same information in Medical School and that's why they won't allow "alternative cancer cures"! Since the results can be measured non-invasively on the skin, it has been widely reported in The Washington Post (1/27/92: 10,000 people/day, "Cures Anything") along with a description of our patents that include the method but not the proprietary information required to break down the bonds in water and increase the Solubility. Investigative reporter Pat Shannan wrote about Otto Warburg M.D. and our machines in the American Free Press. *LEARN MORE...it could save your life! ORDER BOTTLED WATER OR BETTER YET BUY OUR HOME MACHINE! 1-800-433-9553.* Try our anti-aging skin cream that contains our water for ULTIMATE ABSORPTION AND HYDRATION!! Ordinary anti-aging skin creams can't compare because they use ordinary (low Solubility) water!!

Watch a video of John Ellis, the 82 year old Inventor, at www.watercuresanything.com!

About John Ellis…

The 82 year old inventor is a Choate School and Lafayette College Engineering graduate. At just 17 years old, he invented a scientific measuring device that is still used worldwide. After working as an Oil Well Engineer, a Design Engineer at Douglas Aerospace and Honeywell Engineer, he started his own business at age 30 and invented a switch that operates (on-off) within .0001 of an inch. Honeywell and Military/Industrial users say, *"He's the only person that knows how to produce it!"* Likewise, textbook science claim *"You can't change water properties"* but

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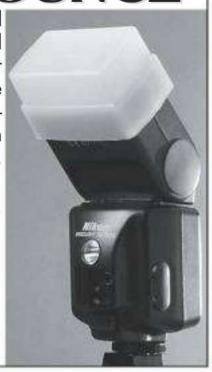

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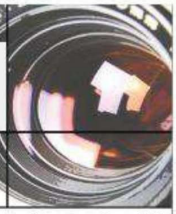

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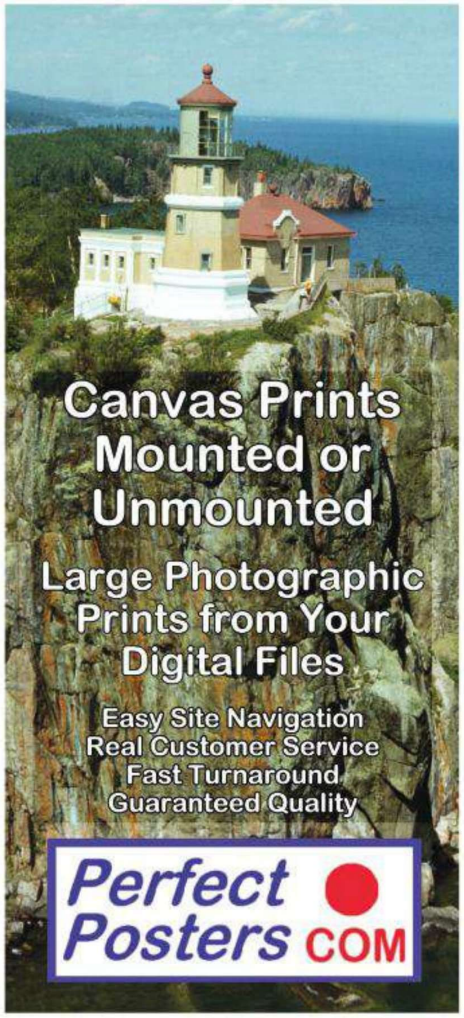

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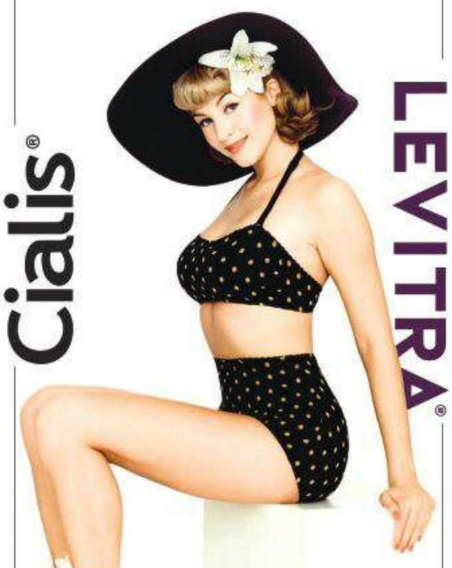

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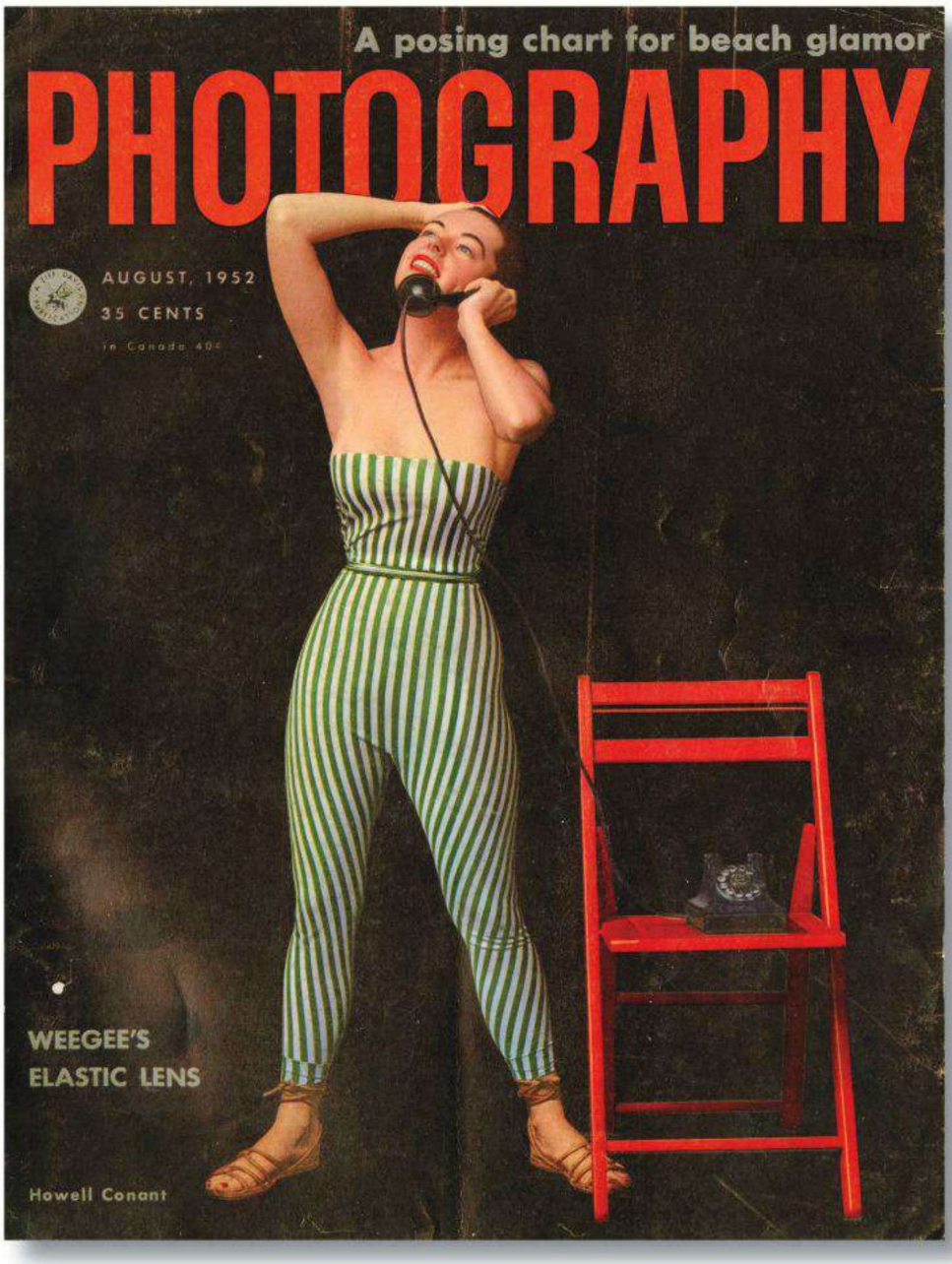

Irresistible Image

When model Audry Murphy walked into photographer Howell Conant's New York studio wearing this outfit, he knew he "had to make this picture." Underexposing by a stop to preserve the pure black background, Conant used an 8x10 Eastman view camera with a 14-inch f/6.3 Commercial Ektar lens. The Kodak Ektachrome Daylight transparency film was exposed at f/11 using electronic flash bounced off the ceiling.

60 YEARS AGO

We profiled Hal Flanagan, a pro photographer who was blind.

Interchangeable TLR

Although everyone loved the twin-lens reflex, the limits of a fixed lens often proved frustrating. Along came the French with the Rex TLR kit, complete with 75mm f/3.5 and 150mm f/5.5 lens assemblies in interchangeable lens boards.

Prontor-S synchro shutters are used for each, with speeds up to 1/300 sec. Made by Photorex in St. Etienne, France, it listed for $298.50, complete. Despite the obvious advantages of providing both normal and long-focus lenses, the Rex was not destined for greatness—it made nary a splash in the TLR universe.

Ready for the Beach

The three "B's" of summer—beauties, bathing suits and beaches—were thoroughly covered (or uncovered?) by ace glamour photographer Peter Gowland in "20 Ways to Pose a Girl." Shown here is kneeling position No. 3. All photos were taken with a Rolleiflex and could be duplicated by our readers by following the posing charts.

Combat Colossus

In an effort to provide combat photographers with a more rugged, versatile camera to replace the venerable 4x5 Speed Graphic, the Army Signal Corps commissioned Graflex to design a new camera. The result? The 70mm Combat Graphic prototype shown here. Resembling a 35mm Zeiss Contax on steroids, it seemed to offer everything that a combat cameraman would need. It used 70mm film to produce 50 2¼x2¾ inch shots per roll.

—Harold Martin

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LAB * LENS TEST

NIKON 85MM F/1.8G AF-S NIKKOR

CONTINUED FROM PAGE 82

In the field, we found the lens fast-focusing and easy to use. While the SWM focusing motor, did, in fact, focus quietly, we still heard its slight buzz and whine in video clips of otherwise noiseless scenes. So if pulling focus while recording video with this lens is in your future, make sure your DSLR will support an off-camera mic. Even a turn of the manual-focus ring was audible in our clips.

In the Popular Photography Test Lab, the lens delivered top-drawer optical performance by all the important metrics, almost matching, in every case, what we found with the $1,700 85mm f/1.4.

Should you wait until you can afford the f/1.4? Both lenses are great for low light, portraits, wedding work, table-top products, and general photography. Both scale up to a 127mm equivalent on DX bodies—suitable to longer tele applications like some sports and nature. Users can also dial in the maximum aperture to selectively clean up a cluttered scene by defocusing the foreground and/or the background.

If you're a wedding photographer who can deduct the cost of the lens, we say go for the f/1.4. It's probably better for candle-lit portraits. The rest of us would be very nicely served by this humble, but magnificent, 85mm f/1.8.

—Julia Silber

SUBJECTIVE QUALITY FACTOR

Our standard lens test, SQF rates sharpness by print size

85 MM

Size	5x7	8x10	11x14	16x20	20x24
1.8	98.1	94.9	92.0	85.6	77.4
2.0	98.0	94.9	91.9	85.4	77.1
2.8	98.2	95.1	92.2	86.1	78.2
4.0	98.5	95.5	92.9	87.5	80.5
5.6	98.8	95.9	93.5	88.7	82.7
8.0	97.1	96.2	94.1	89.7	84.3
11.0	97.0	96.1	94.0	89.6	84.2
16.0	96.7	95.7	93.4	88.5	82.5

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SIGMA 50–150MM F/2.8 EX APO DC OS

CONTINUED FROM PAGE 84

contrast in the Excellent range for the three tested focal lengths. At the long end, the performance was significantly better than the 70–200mm, which rated only Very Good at 200mm. But the new lens underperformed the one it replaces: Almost all of the earlier (now discontinued) 50–150mm f/2.8's SQF scores (at 11x14, our benchmark) landed in the red zone on our chart—in the mid-to-high 90th percentile. This may be the price of stabilization; the previous version was also half the weight, half the price, and 2 inches shorter.

Still, this new lens did a much better job at controlling distortion and vignetting than its predecessor.

Indeed, most of this lens's blemishes are more peccadillos than serious problems. With that bright maximum aperture, on-board stabilization, and popular focal length range, this zoom will exert an almost irresistible allure on upwardly mobile APS-C shooters. Paired with Sigma's 17–50mm APS-C f/2.8, and maybe a teleconverter, it can be the rock on which a long-lived pro or semi-pro career is built. *—Julia Silber*

SUBJECTIVE QUALITY FACTOR

Our standard lens test, SQF rates sharpness by print size

50 MM

Size	5x7	8x10	11x14	16x20	20x24
2.8	96.2	95.1	92.4	87.0	80.4
4.0	96.3	95.2	92.5	87.2	80.7
5.6	96.3	95.2	92.5	87.2	80.6
8.0	96.1	95.1	92.4	87.1	80.5
11.0	96.2	95.0	92.2	86.6	79.9
16.0	95.9	94.8	91.5	85.5	78.1
22.0	95.3	93.9	90.5	83.6	75.0

100 MM

Size	5x7	8x10	11x14	16x20	20x24
2.8	98.0	97.3	95.4	92.2	89.0
4.0	97.9	97.1	95.0	91.5	89.1
5.6	98.0	97.3	95.4	92.2	89.2
8.0	97.8	97.0	94.7	91.1	87.6
11.0	97.5	96.5	93.7	89.0	84.6
16.0	96.9	95.5	91.6	85.1	78.8
22.0	95.9	94.0	88.5	79.2	70.4

150 MM

Size	5x7	8x10	11x14	16x20	20x24
2.8	96.6	93.4	87.3	77.2	68.5
4.0	96.0	94.1	88.8	79.9	72.0
5.6	96.6	95.0	90.7	83.3	76.5
8.0	96.7	95.2	91.1	84.2	77.7
11.0	96.6	95.1	90.7	83.5	76.7
16.0	96.2	94.4	89.4	80.9	73.1
22.0	95.4	93.2	86.9	76.3	68.6

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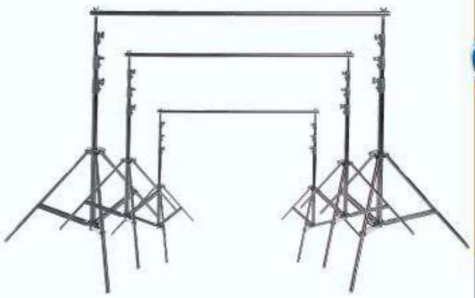

The background stand comes with interlocking 4 section crossbar. and a handy carrying bag with compartments.

The top of the stand meets the crossbar there is a screw and wing nut to keep the crossbars secured to the stands.

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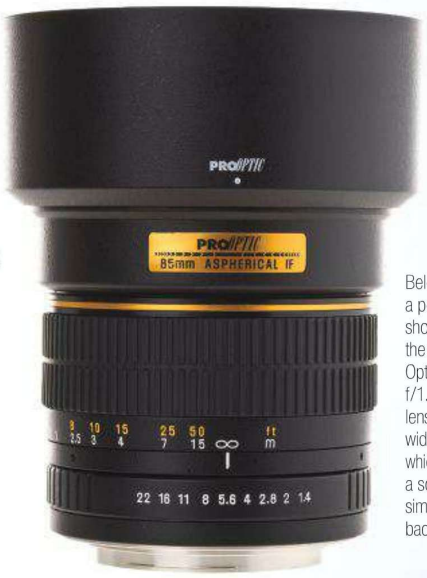
LENS REPORT

GLASS ACT

PRO OPTIC 85mm f/1.4 ASPH



Below, a portrait shot with the Pro Optic 85mm f/1.4 ASPH lens set wide-open, which created a soft, simplified background

If you think you can't afford the fast optics needed for soft portrait backgrounds, this lens will change your mind. By Marvin Good

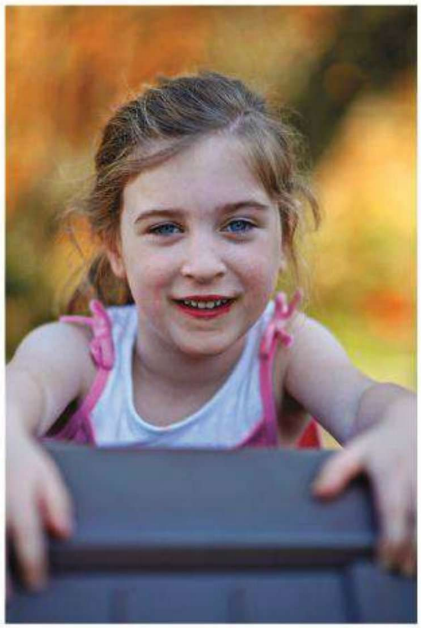
Who doesn't love the soft, out-of-focus background in a great head-and-shoulders portrait? The shallow depth of field needed to create the effect dramatically isolates subjects from their environment, blurring distant detail to make it less distracting.

Yet soft backgrounds come at a price, literally. "Portrait" lenses —moderate telephotos with wide maximum apertures—are expensive because their glass elements must be wider too. It's tempting to splurge, because with an all-purpose zoom set to moderate-tele, the maximum aperture is too small to smooth out the background.

Now budget-conscious photographers can have it both ways. The Pro Optic 85mm f/1.4 ASPH is a high-quality portrait lens that produces a soft, creamy defocus, yet costs a fraction of your DSLR system's equivalent. This fast prime lens has a nine-element optical formula that incorporates state-of-the-art aspheric design.

The Pro Optic's cost is also kept reasonable by eliminating autofocus. Is that a drawback? Not for the close portraits this lens excels at. Many photographers actually turn off their AF system to keep the focus point from shifting every time they take another shot. Manual focus means that once focus is set, you can concentrate on the subject's expression.

Photographers who've bought this well-built lens give it high marks. "Nice bokeh," says one, referring to the smooth quality of its out-of-focus backgrounds. "It feels like a much higher-priced lens," writes a reviewer at *Adorama.com*. "I've compared it to to many other name-brand lenses, and the difference in optical quality is nil." Indeed, the Pro Optic 85mm f/1.4 ASPH stays sharp where you need it to be—on your subject's features—even when you set it wide-open, to f/1.4.



The lens's 85mm focal length delivers flattering perspective when you're shooting up close and personal, with no bulging noses or big foreheads. And while it "covers" full-frame DSLRs such as the Canon EOS 5D or Nikon D700, it can also be used on smaller-sensor DSLRs such as the Nikon D5100 or Canon EOS Rebel—yielding effective, portrait-perfect focal lengths ranging from 110mm to 146mm. ■

The Pro Optic 85mm f/1.4 ASPH is available exclusively from ADORAMA, starting at $279. To order, visit the Adorama store, *Adorama.com*, or call (800) 223-2500.

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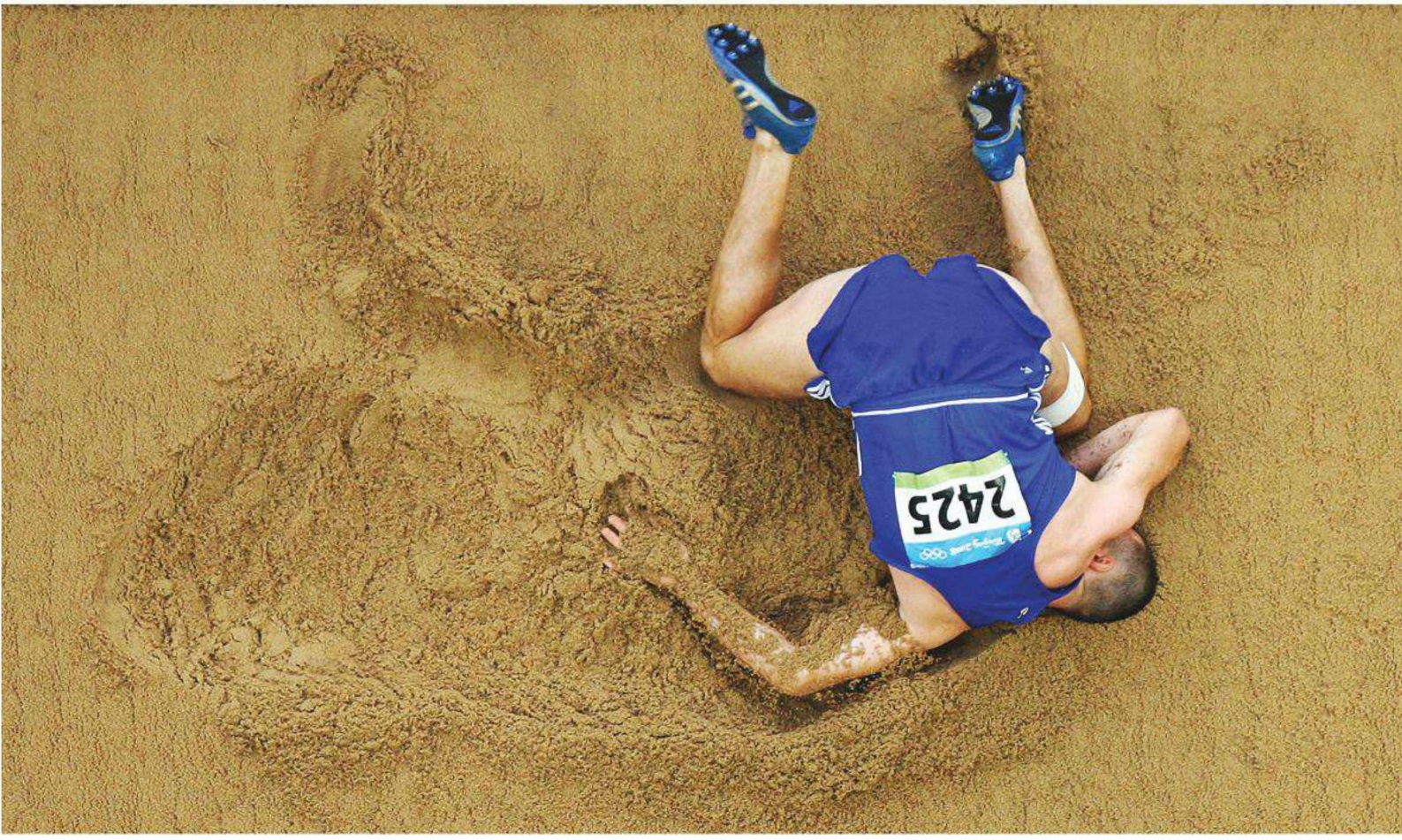


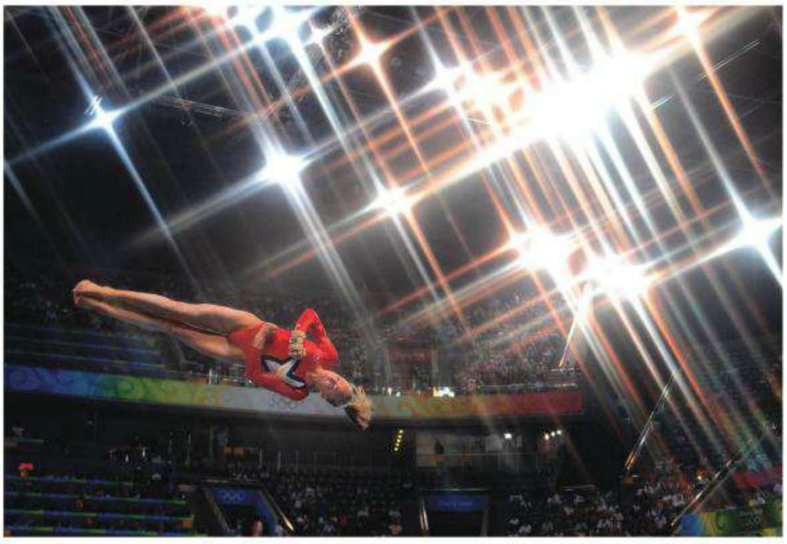
AL BELLO/GETTY IMAGES (JUMPER); MARK J. REBILAS (GYMNAST)

CONTINUED FROM PAGE 67

"Gear Run" (page 68). And you can gaze in wonder at the massive amount of stuff that Wyatt hauled to Beijing the last time around at www.ronwyattphotos.com/#about-me/rons-gear-box.

Prepare to Compromise

After focusing and lens selection, the most important photographic consideration for capturing action is obviously exposure. It comes down to two factors: You want the fastest shutter speed you can use under the given lighting conditions, and you'll need to use the highest ISO that you can without getting too much noise in your images.



LONG SHOT
Decathletes don't land with much finesse after long jumps, says Al Bello of this award-winning shot of Victor Covalenco in Beijing, "so I positioned myself for the landing, not the leap."

STAR TURN
Often, indoor lighting can be dim, flat, and without character. To add a bit of life, Mark Rebilas turns to his trusty star filter.

If you're covering indoor gymnastics, and the lighting isn't great, you'll have to bump up the ISO. With some cameras, the highest you can go before noise sets in is about ISO 1600. In today's world that's not high enough. "If I'm going into a dimly lit gym, I want at least ISO 2000," says Wyatt. (Read our camera tests to find out which bodies are best for controlling noise at high ISOs, and rent one if you must.)

Another photographic challenge: backgrounds. "The worst are when you've got bored people standing around, not watching the event you're photographing," says Wyatt. One solu-

OLYMPIC INSIGHT

Ron Wyatt, freelance

"The most surprising thing to me about the Athens and Beijing summer Games was how the foreign photographers worked. If someone stepped into their picture or blocked their view, they had a fit. Even with judges and referees. The American photographers, in comparison, were perfect ladies and gentlemen."

tion to problem backgrounds? Find camera angles with *distant* backgrounds and defocus them by shooting wide open.

Another technique: Climb as high into the stands as you can or get permission to mount your camera in the rafters, and use a remote to shoot down on the action. Scout the venues early so you will have time to file for the necessary permissions. Getting low can also be an option.

Converting files from color to b&w can declutter a messy background, too. "Color can be distracting," says Al Bello. "Bad backgrounds can have poles, empty seats, and random people loitering, but overly vibrant color can also be a problem."

Going to the London Olympics this year? Mark Rebilas (www.markjrebilas.com), a pro shooter from Phoenix, says the fun part will be shooting a wide variety of sports, many of which you can't regularly cover back at home. Seeing what other photographers are doing will inspire you, and for this American, "the overwhelming feeling you get when the Star Spangled Banner plays after a U.S. athlete takes the gold is like no other feeling in sports."

LEGENDARY IMAGES from summer Olympics past are in the July/August issue of *American Photo*, available on newsstands, at the iTunes store (for the iPad), or online at www.americanphotomag.com.

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CONTINUED FROM PAGE 59

pixel-shift technology to deliver 16-bit images up to 12.7MP. (Pixel shift moves the sensor in tiny increments to record data from multiple captures.)

Lighting for Tiny Studios

As in all other forms of photography, lighting is the key element. As you might imagine, Pasieka uses lighting techniques far beyond those substage mirrors or battery-powered lamps some of us used on high-school microscopes. The type of lighting employed, he explains, "depends on the specimen and what effect you are looking for."

For insect parts, such as the tick image shown below, dark-field illumination works well, he says. Dark-field is sort of like rim lighting at the microscopic level: Substage lighting is partly blocked by a disk in the light path, so that the microscope's objective sees only scattered light from the specimen. (You can use this technique easily enough with a hobbyist microscope, however.)

Illumination by polarized light is very effective for crystals and plant parts, Pasieka notes. This was the technique used for the adenine, caffeine, and clover images on the preceding pages, and for the bone cross-section seen above.

The jaw-busting differential interference contrast (DIC) microscopy, an advanced form of polarized lighting, exploits the interference of polarized light along two different paths to enhance contrast in detail that might ordinarily be invisible. This lighting was used for the radiolaria photo in the opening spread. (Remember staining specimens on microscope slides in high-

TICK, IXODES RICINUS The carrier of Lyme disease in Europe, its barbed, bloodsucking mouth parts are visible in 40X view. Made with a Leica/Zeiss microscope on 6x7 Fujichrome 50 Tungsten.

HUMAN COMPACT BONE A 100X cross section shows concentric bony circles (lamellae) arranged around Haversian canals. A Leica/Zeiss microscope with a 6x9 rollfilm holder was used to make the image on Fujichrome 50 Tungsten.

school biology? DIC can bring out detail in specimens without the need for staining.) Pasieka adds that microchips and other opaque materials show their surfaces nicely with DIC, and this was indeed the technique used in the microchip photo on page 57.

Always Experimenting

Pasieka's success comes not just from mastery of microscopic and photographic technique, but from approaching his work as a scientist, someone constantly looking for discovery and understanding. "I always search for new forms of visual expression, and therefore I do a lot of experimental work to find new creative approaches to the micro world," he tells us.

To explore this world, Pasieka advises, "A good point to start would be to locate an amateur microscope club near you. They always like guests, and you can get a first look of what microscopy is all about." He also suggests the online community photomacrography.net/amateurmicroscopy, as well as www.microbehunter.com.

An extensive body of information can be found at Nikon's microscopyu.com website. It also sponsors the worldwide Small World photo contest, whose site, nikonsmallworld.com, hosts galleries of micrographic art. Olympus has a photomicrography resource center at olympusmicro.com, and holds a similar imaging competition called BioScapes.

"The most beautiful pictures are not from human painters," Pasieka concludes, "but from Mother Nature!"

You can see more of Alfred Pasieka's photos and photo-illustrations at alfred-pasieka.de/index_en.php.

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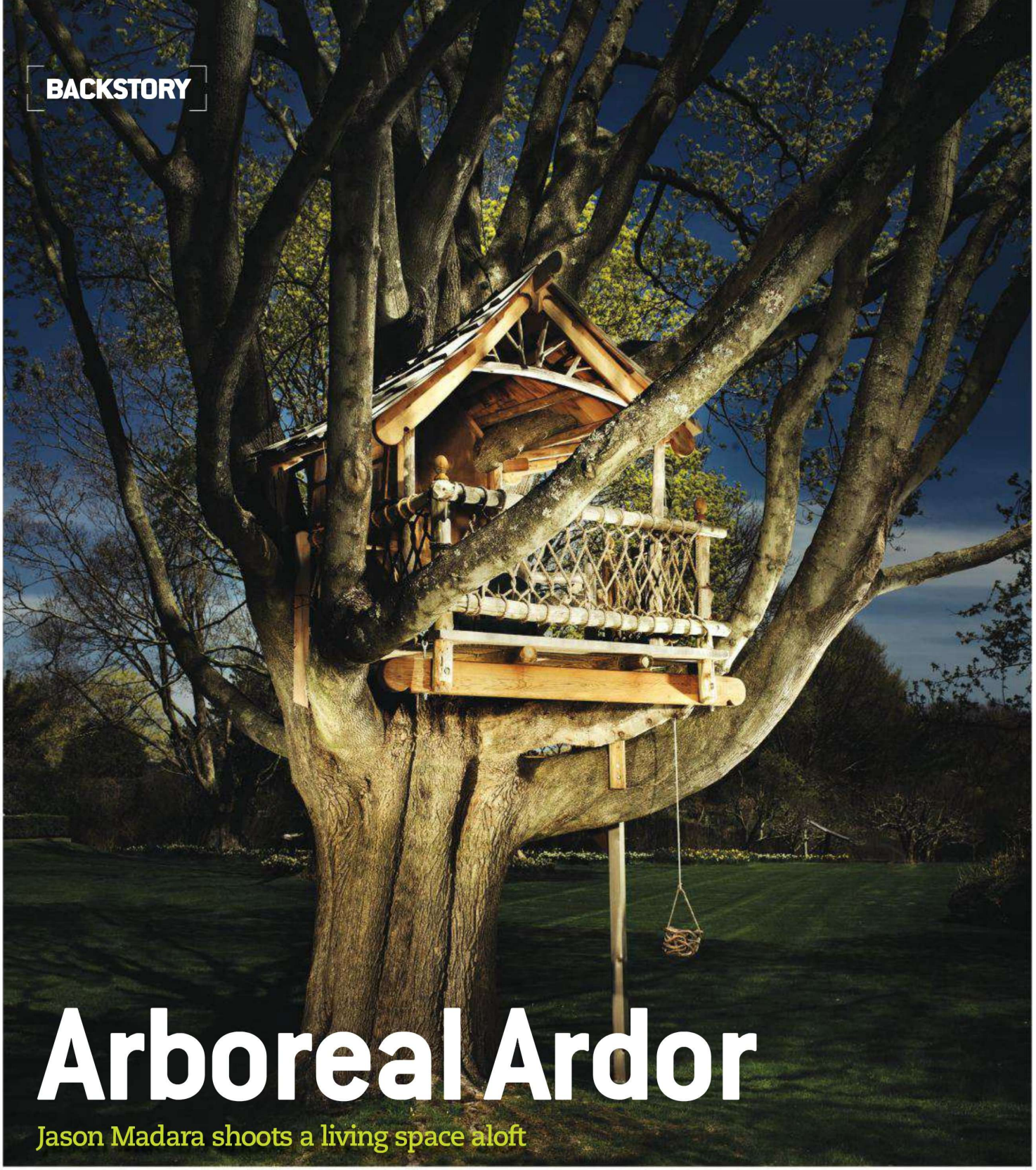

Arboreal Ardor

Jason Madara shoots a living space aloft

IN 2007 I had an assignment for *Cookie* magazine to shoot designer treehouses. Unusual as this sounds, it's a popular home addition—some firms cater to it exclusively. In L.A., some of them are massive, four-stories high. In Seattle, I captured a treehouse that was nearly 40 feet above the ground, tricky in terms of lighting. This one was in the Hamptons.

The creative director wanted a surreal, dream-like approach. I was working during daytime, but I'd brought four Profoto lights, and positioned them below and within the treehouse, adjusting exposure to make it feel strange—a dream-space at nighttime. The style has led to a lot of assignments since.

I remember this assignment more for the experience: One night, I slept in the treehouse.

—As told to Lori Fredrickson

To see more of Madara's work, check out jasonmadara.com

JASON MADARA

Focal length: 70mm Exposure: F/2.8 Aperture fully opened 1/80 sec ISO100

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